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AN ARSENICAL WITH A BRILLIANT RECORD OF EFFECTIVENESS AND SAFETY

MAPHARSEN

PARKE, DAVIS & COMPANY, DETROIT 32, MICHIGAN

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## THE POSTWAR CHALLENGE TO ORTHOPEDIC SURGERY

CHAIRMAN'S ADDRESS

GUY A. CALDWELL, M.D.
NEW ORLEANS

It may be said that the specialty of orthopedics had its origin in 1780, when Jean-André Venel established in Orbe, Switzerland, the first orthopedic institute for the correction of curvatures and torsions of the spine.[1] Little more than tenotomies and mechanical corrections of deformities were developed, however, prior to the works of William John Little, who established the Royal Orthopaedic Hospital in London in 1837, and Hugh Owen Thomas of Liverpool (1834-1891), whose name is perpetuated in his extension splints.[1] Thus the specialty became recognized in England and America only about a century ago. It was nearly fifty years later, however, that Robert Jones and his associates in England and Whitman, Davis, Bradford, Lovett and others in America truly emancipated the specialty into orthopedic surgery as we know it today. Of the advent of surgery in orthopedics, Whitman[2] wrote "It transformed an ill found and static specialty to an important and progressive branch of surgery."

The impetus given to orthopedics by operative surgery found expression in America in the establishment of the American Orthopaedic Association and, a little later, the Section on Orthopedic Surgery of the American Medical Association. There was, however, no comparable organization in Great Britain before World War I, and Robert Jones and his associates were virtually the only widely known orthopedic surgeons in England. As Betts[3] stated, "At the outbreak of war in 1914 orthopedics as a special branch of surgery was comparatively unknown in Britain and Australia."

### EFFECT OF WORLD WAR I ON ORTHOPEDIC SURGERY

Sir Robert Jones recognized in the large number of wounded and disabled soldiers a challenge to orthopedic surgery, which, with his exceptional skill and knowledge combined with a marvelous personality and ability to organize, he met with such success that the specialty emerged much stronger than ever before. James A. Dickson,[4] my illustrious predecessor as chairman of this section, stated in his address, two years ago:

> Under serious opposition Robert Jones was entrusted with the establishment of the first military orthopedic service in any country, having 200 beds at Alder Hey in Liverpool. The results were so striking that within a short period 33,000 beds were equipped and staffed with English and American orthopedic surgeons. . . . According to Goldthwait, 65 per cent of the casualties in the last war were orthopedic cases, and by the time of the armistice 569 officers had served with the Orthopedic Division of the American Expeditionary Forces.

In a discussion of the evolution of orthopedic surgery Freiberg[5] has aptly indicated the stimulus which World War I provided in the progress of orthopedics:

> The World War had a great influence on orthopedic surgery, especially in Great Britain and in the United States. . . . By reason of the wider contacts which military experience brought to orthopedic surgeons, reciprocal relationships with their colleagues, of more intimate nature than civil life had furnished, were established. . . . They returned from military to civil life with their own professional concepts greatly expanded . . . very few of them resumed their civil occupations without profound alteration in their attitude toward their professional activities and toward their colleagues. . . . From the time when the identity of the orthopedic surgeon became recognized, the care and the rehabilitation of the cripple has been his particular province.

### PROGRESS DURING PEACETIME

Because the medical officers assigned to orthopedic services during World War I returned to their civil occupations with "profound alteration in their attitude toward their professional activities and toward their colleagues," [5] rapid advancement of the specialty continued during peacetime. Numerous articles, journals and books began to appear in the literature. The American and British orthopedic associations flourished, the Section on Orthopedic Surgery of the American Medical Association became more active and soon many smaller groups appeared. Then, twelve years ago, the Academy of Orthopaedic Surgery was organized and two years later the American Board of Orthopaedic Surgery. The combined influence of these various groups and individuals began to be felt in medical schools, hospitals, communities, states and the entire nation. As a result a state and federal program was inaugurated to provide care for crippled children under the Social Security Act, the validity of the expert

From the Department of Surgery, Tulane University School of Medicine, and the Section on Bone and Joint Surgery, Ochsner Clinic.

Read before the Section on Orthopedic Surgery at the Ninety-Fourth Annual Session of the American Medical Association, June 15, 1944.

1. Garrison, F. H.: Introduction to the History of Medicine, Philadelphia, W. B. Saunders Company, 1929.
2. Whitman, R.: The Emancipation of Orthopaedic Surgery, Proc. Roy. Soc. Med. **36:** 327-329 (May) 1943.
3. Betts, L. O.: Orthopaedics and the Great War, M. J. Australia **2:** 35-38 (July 13) 1940.
4. Dickson, J. A.: Orthopedic Surgery Between Two Wars, J. A. M. A. **120:** 413-416 (Oct. 10) 1942.
5. Freiberg, A. H.: Orthopaedic Surgery in the Light of Its Evolution, J. Bone & Joint Surg. **19:** 279-296 (April) 1937.

opinions of orthopedists was recognized in courts and by compensation commissions on disability ratings, and the National Foundation for Infantile Paralysis and similar agencies were organized.

Although expansion of orthopedic surgery as a specialty was rapid during the twenty-four year interval of peace, it failed to keep apace of the demand. So well defined is the role of the orthopedic surgeon in the tables of organization of the armed forces that immediate demand for all physically fit surgeons under 45 years of age was made on the profession. The response was prompt, but unfortunately the number available was all too small. Whereas 288 surgeons certified by the American Board of Orthopaedic Surgery are now serving with the armed forces in responsible positions, each of them is being assisted by three or more partly trained orthopedic surgeons or general surgeons. In this way a large new group, approximately 900, is being drawn into intimate contact with the specialty and it is safe to predict that more than half of these will complete their training after the war, will limit their practice to this specialty and ultimately will be certified as orthopedic surgeons. Meanwhile a greatly diminished, nevertheless considerable, number of younger men, disqualified for military service, are continuing their training in routine channels at home. It is highly probable, therefore, that within the next five or ten years the number of men certified in the specialty of orthopedic surgery will be doubled or perhaps trebled, until it will reach 2,000 to 2,500 men in the United States.

At first glance it might appear that such rapid increase in the number of men certified to practice orthopedic surgery might overcrowd the specialty. If we study the probable postwar demands, however, it appears likely that the requirements will be far greater than the increased numbers can serve. The contacts of hundreds of thousands of young men and women now in the armed forces with organized orthopedic services are numerous. From the induction centers, where part of the physical examination is done by orthopedists, to minor or major injuries received while in training and treated on orthopedic services of the camp or station hospitals, on through combat duty, when those with wounds in the extremity trail back through evacuation hospitals to the orthopedic services of the general hospitals abroad and at home, thousands on thousands will learn for the first time the value of special training and skill in the care of crippling diseases and injuries. This knowledge is shared by other thousands of their buddies, families and hospital attendants and will go back with them into civil life. From the homes and families established by these men it is certain that greater and more frequent demands will be made for orthopedic care.

Large numbers of professional personnel with the armed forces—physicians and nurses not assigned to orthopedic services—are daily brought face to face with the fact that in army hospitals throughout this country 35 to 40 per cent of the patients are in orthopedic services, and in the combat areas 65 per cent of the wounded have injuries of the extremities. They perforce become "orthopedic conscious" by daily reference of patients and requests for orthopedic consultations. On their return to civil life it will be second nature to refer such patients for orthopedic care.

During the early postwar period Veterans' Facilities must necessarily be greatly expanded and the orthopedic services conspicuously enlarged. Already the Vocational Training and Rehabilitation Program under the Social Security Act as amended in June 1943 is providing a system for medical care which will include a large percentage of orthopedic cases. State crippled children's services, which have been compelled to operate with skeleton staffs, will enlarge to their former size, and many new organizations will lend aid to orthopedic programs.

Therefore the postwar demand on the specialty of orthopedic surgery will be strikingly increased as a result of our awakened consciousness of the meaning and value of orthopedic service through observation of its work in the armed forces by thousands of lay and professional workers who will eventually return to civil life in widely scattered areas. Their demands will be supplemented by those growing out of the gradual spread and natural growth of civilian orthopedics through development and expansion of the programs for crippled children and vocational rehabilitation. Soon the man in the street will cease to stammer and stall when he attempts to pronounce orthopedist and to confuse the term with osteopath, chiropractor and chiropodist. Moreover, the public is rapidly realizing the truth of Freiberg's statement that "from the time when the identity of the orthopedic surgeon became recognized the care and the rehabilitation of the cripple has been his particular province."

The postwar challenge to orthopedic surgery is presented by the assurance of an overwhelming demand for its assistance to rehabilitate the cripples and the equal certainty that, although the number of trained orthopedists available to meet this demand will be greatly increased, it will be insufficient. In 1942 there were 180,496 physicians in the United States, only 707 of whom were certified orthopedists, or 0.39 per cent. When this small percentage is balanced against the fact that in military hospitals about 40 per cent of the work is assigned to orthopedic services, it is not improbable that postwar civilian demands will require that 20 to 25 per cent of its hospital population be cared for by orthopedists. If we assume that the number of physicians will be 200,000 and the increased number of orthopedic surgeons 2,000, we are confronted by a situation in which 1 per cent of the physicians will be trying to care for 20 to 25 per cent of the hospitalized patients.

What can we do to meet this challenge? First, we must inventory our assets and organize them to meet this situation to the best advantage. It is obvious that the basic need is for the rapid but efficient training of a large number of younger physicians. To accomplish this it will be necessary for every practicing orthopedist to constitute himself a teacher and use his facilities and time to assist in training several younger men to succeed him. More articles, periodicals and books on orthopedic problems should be published. Organizations such as this one, the orthopedic section of the greatest medical association in the world, together with the American Orthopedic Association, the Academy and all of the smaller, more intimate, groups should plan constructive programs of instruction that will awaken interest and attract younger men to the field of orthopedic surgery. Medical schools and their

graduate departments should enlarge their facilities and apportion their time to provide more emphasis on instruction in this surgical specialty. Hospitals should begin to organize their orthopedic services for approved resident training in this special branch of surgery. Nursing schools should encourage some of their graduates to specialize in this field and others to train in physical therapy and occupational therapy.

At present the report of the Council on Medical Education and Hospitals lists only 84 approved resident training services in orthopedic surgery, most of these in the older centers or affiliated with universities or hospitals for crippled children. A survey of hospitals having orthopedic services for crippled children staffed by specialists certified by the American Board of Orthopaedic Surgery reveals 200 services which should be qualified and approved for training. Many other general hospitals have large services for fractures and other traumatic injuries of the extremities that have sufficient clinical material under competent supervision to provide adequate training for orthopedic residents for at least one of the three required years. Every medical school in the country can and should provide six months of graduate training, especially in the basic sciences of anatomy, pathology, physiology and biochemistry, to supplement the training of men who may acquire their clinical experience in hospitals and clinics not affiliated with universities.

Retired or demobilized medical officers will be eligible for graduate training in various specialties with governmental pay. Advantage should be taken of this to offer supplementary training to all officers who have served in orthopedic services with the armed forces and to attract additional young men who have been serving with the field units. Experienced orthopedic surgeons now in the service who are capable of teaching should be demobilized and returned to their teaching posts as rapidly as possible to assist in this great move. Every one of us must look ahead and begin now to arrange his work and hospital service to provide time and facilities for instruction for those who will be needed to meet this great postwar need.

SUMMARY

As rapid as have been the advances of the specialty of orthopedic surgery during the last fifty years, it has been unable to keep abreast of the increasing demand. World War II has accentuated the demand without helping materially to increase the number of trained orthopedists to meet it. It appears probable that in the postwar period 1 per cent of the physicians specializing in orthopedic surgery will be required to care for 20 to 25 per cent of the hospitalized civilians. It is therefore urgent that more men be trained in the specialty. To provide orthopedic training for the number of physicians who will be needed in the postwar era, all available hospital services should be qualified for approval by the Council on Medical Education and Hospitals and the American Board of Orthopaedic Surgery, and all medical schools should expand their teaching facilities for orthopedics, especially their graduate courses in the basic sciences of anatomy, pathology, physiology and biochemistry.

3503 Prytania Street.

# A PSYCHIATRIC STUDY OF SUCCESSFUL SOLDIERS

CAPTAIN JACK G. SHEPS
ROYAL CANADIAN ARMY MEDICAL CORPS

Studies of soldiers who broke down in training or under what was considered to be minimal stress in battle led to the establishment of present standards for psychiatric screening. These standards have been criticized on the grounds that they were based on observations of selected groups. It has been suggested that men with good motivation and a desire to serve can cover up and compensate for psychoneurosis. This paper is an attempt to test our psychiatric screening standards by a study of 116 successful soldiers and compares the findings with those obtained in studies of neurotic soldiers.

Studies of neurotic soldiers have been done by Rosenberg [1] and Slater.[2] Ebaugh [3] and his associates studied 100 soldiers designated as well adjusted by their officers and compared them with 100 psychiatric cases. Uninjured combat veterans with no complaints were studied by Schwab, Finesinger and Brazier [4] and compared with cases of combat neurosis and neurosis developed in training. Steinberg and Wittman [5] studied ordinary soldiers and compared them with a group of neurotic and psychotic patients.

This is a study of 115 soldiers and 1 sailor. Fifty-eight at several camps in various phases of training were chosen by their training officers as the best all around men in a group—usually a platoon. Fifty-seven soldiers and 1 sailor injured in a theater of action were also studied. These men entered the service before psychiatric screening was established, but they were all front line fighting troops and had no presenting psychiatric disabilities. Men from base areas or lines of communication, subject only to air raids, were excluded. In the case of the soldiers in training, a short report from the training officer accompanied the man explaining why he was chosen, together with a note by the personnel selection officer. A limited social service investigation was done in every case. A psychiatric interview of at least thirty minutes was carried out. The purpose of the study was outlined and the man's cooperation enlisted. It was stressed that the interview was unofficial and would in no way affect the soldier's career in the Army or the matter of pensions. All the men cooperated very well and spoke freely. Most of the combat veterans came from two regiments, and it was possible to check on their behavior with others in the same unit. Two of the veterans

From No. 2 District Depot, Toronto, Ontario, Canada.

Read before the Section on Nervous and Mental Diseases at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Rosenberg, S. J., and Lambert, R. H.: Analysis of Certain Factors in Histories of 200 Soldiers Discharged from the Army for Neuropsychiatric Disabilities, Am. J. Psychiat. **99:** 164 (Sept.) 1942.

2. Slater, E.: The Neurotic Constitution, J. Neurol. & Psychiat. **6:** 1-16 (Jan.-April) 1943.

3. Billings, E. G.; Ebaugh, F. G.; Morgan, D. W., and others: A Comparison of 100 Army Psychiatric Patients and 100 Enlisted Men, War Med. **4:** 283-298 (Sept.) 1943.

4. Schwab, R. S.; Finesinger, J. E., and Brazier, M.: Psychoneurosis Precipitated by Combat, U. S. Nav. M. Bull. **47:** 535-544 (March) 1944.

5. Steinberg, D. L., and Wittman, M. P.: Etiologic Factors in the Adjustment of Men in the Armed Forces, War Med. **4:** 129-139 (Aug.) 1943.

enjoyed a more intimate relationship—they were wounded by the same bomb. The study was restricted to noncommissioned men; all but 9 were privates. The soldiers in training had been in the Army from three to eight months and the combat veterans from two to four years, about half having been wounded in the Sicilian campaign and half in the Italian campaign. After each interview the man was graded as if he were a candidate for enlistment, without taking into consideration his progress and record in the Army.

## FINDINGS

Ages ranged from 18 to 40 years, with 77 men between 20 and 30. The racial origins reflected approximately the distribution in the general population.

Army aptitude test scores were available for the 58 soldiers in training and 26 combat veterans. Forty-three per cent fell into the highest 5 per cent and only 10 per cent into the lowest 30 per cent.

Only 8 of the 116 did not complete elementary school, and only 3 of these had poor school records. Four of the men attended university and the rest attended high school.

*Greatly Diminished Incidence of Significant Psychiatric Data in Successful Soldiers as Compared with Psychiatric Discharges*

| | Present Series, % | Slater, % | Rosenberg and Lambert, % |
|---|---|---|---|
| Work history | | | |
| Poor work record | 1.0 | .... | 54.0 |
| Skilled and semiskilled | 85.0 | 48.0 | .... |
| Family history | 14.6 | 55.7 | 39.5 |
| Childhood neurotic traits | 31.0 | 58.8 | .... |
| Bad home | 6.8 | 20.9 | .... |
| Previous personality or mental disorder | 3.4 | 40.0 | 89.0 |

One hundred and seven men had worked for one or more years; 33 were classified as engaged in skilled work, 58 semiskilled and 16 unskilled. Only 1 had a poor work record.

Thirty-eight had had previous military experience in the militia or cadets.

The family history was considered to be significant where psychoses or epilepsy occurred in the immediate family or first degree relatives, or where neurosis and severe personality maladjustments, such as chronic alcoholism or constitutional psychopathy, occurred in the more immediate family. There were 17 significant family histories. These included 3 cases of epileptic seizures in an uncle, aunt and brother, and schizophrenia in an uncle. If one excludes these as not being a factor in the predisposition to neurosis, there remain 13 positive family histories.

A bad home, in the sense of excessive poverty, drunkenness or family disagreement with constant anxiety and uncertainty, was present in 8 cases, and in half of these one parent deserted the family when the soldier was under 13.

Forty-nine men showed some signs of instability:

(*a*) Ten had pulse rates of 90 to 100.

(*b*) Fifteen showed nail biting—only 1 severe.

(*c*) Twenty-four showed tremor and sweating of the hands—only 1 severe.

Neurotic traits in childhood were present in 36 of the men; 24 had one trait, 7 had two traits and 5 had three traits.

Personality assessment is difficult in one interview, but 18 men could be classed roughly as introverted and 23 as extroverted. Seventy-five fell into neither of these categories. All had made good social adjustments and had normal recreational outlets. None of the men had any spontaneous health or "nerve" complaints.

An effort was made to see if the men understood the principles at stake in this war. I considered them to have good motivation if they could define fascism as an authoritative, dictatorial form of government, if they understood the concept of "master race" as used by the fascists, if they were conscious that fascist and democratic states could not exist side by side and if they felt that there would be no place for them in a world ruled by fascism. A great deal of importance was attached to the last question, and the motivation was graded good, fair or poor. Ninety-four were found to have good motivation, 4 fair and 18 poor.

Four men were downgraded at the time of this study, 1 for base duties in a theater of action and 3 for service in Canada only. These were all in the group of training soldiers. Seven were graded "accept for recheck"; that is, they would be seen by a psychiatrist at the end of a period of training.

## COMMENT

The table compares certain of these findings with those of Slater [2] and Rosenberg [1] in their studies of soldiers with psychiatric disabilities and emphasizes the low incidence of significant psychiatric data in this series. Ebaugh,[3] Steinberg [5] and Schwab [4] do not give absolute figures, but all report a much greater incidence of signs and symptoms of instability, positive family and developmental histories and poor social and work adjustments as compared with their controls of normal men.

This study was undertaken to evaluate a criticism which few service psychiatrists take seriously; that is, that our standards are too strict and that we screen out men who would make good combat soldiers. If this criticism were valid, one would expect to find more men who do not meet the present screening standards among the unscreened battle veterans than in the screened group of soldiers in training. The soldiers in training went through our screening, and there were indications for the downgrading of 4. All of the "accept for recheck" cases would have had their gradings for full duty confirmed. All the combat veterans enlisted in the Army before adequate psychiatric screening was established, but a natural selection had taken place, with weeding out of the psychiatrically unfit during training, the battle of Britain and a long period of waiting before action. All had been through battle stress, and none had developed a psychiatric disability. That our screening standards are no stricter than natural battle stress screening is shown by the fact that none of these men whose stability was unaffected by battle would have been rejected. Thus our errors are, if anything, in the direction of leniency.

It is interesting that only 15 of the training soldiers had clear family and developmental histories and presented no signs or symptoms of instability, but apart

from the 4 that were downgraded their original assessments were correct, and they were making good soldiers.

Only 24 of the 58 combat veterans were completely "normal," and yet all of them had seen action without developing any psychiatric disability. This bears out the conclusions of Steinberg,[5] who says that "for every factor investigated there is a definite overlap of adjusted and maladjusted groups. The number and intensity of these factors evidently are cumulative in their effect and on the adjustment of the individual selectee." In this group the 2 cases showing severe fingernail biting, tremor and sweating of the hands, and 3 of the 5 men presenting three childhood neurotic traits were downgraded. Of the remaining 2, 1 would be accepted for recheck.

It must be emphasized, however, that the total picture of the individual man in his environment must be considered and all significant data evaluated in the light of his present civilian adjustment. The frank neurotic, psychopath or prepsychotic personality is not a diagnostic difficulty, yet it is generally agreed that if only these are rejected a considerable number of men will still break down in training or after minimal stress in a theater of action.

It is the feeling of psychiatrists in the Canadian Army that the maintenance of proper screening standards depends on the experience of the screening psychiatrists with men who break down in training or are returned from overseas because of psychiatric disability. Doubtful cases are accepted for recheck, and the screening psychiatrist receives a copy of the report of the examination at the training center. Study of the percentage and types of these cases that require a lowering of category provides a check on the validity and rehability of the psychiatric evaluations of the individual psychiatrists. It has been found that the rejection rates of the psychiatrists at the same induction centers differ very little in spite of varied training and professional backgrounds and in spite of the lack of objective criteria that can be laid down for rejection. It is not felt that psychiatric screening can ever exclude all psychiatric casualties, but, as Kubie[6] maintains it should greatly reduce the number occurring in training and under minimal battle stress.

## SUMMARY AND CONCLUSIONS

1. Fifty-eight successful soldiers in training (screened) and 58 combat veterans (unscreened) with no presenting psychiatric disability were studied.

2. Screening standards in use at present in induction centers of the Canadian Army were applied. Using these standards, 4 training soldiers were downgraded, 1 to limited duty in a theater of action, 3 to service in Canada only. None of the combat veterans were downgraded.

3. There was no significant difference in the findings in the two groups of men.

4. Ninety-four were found to have good motivation and high morale. This factor can be adequately assessed only after studies of unselected groups have been made.

5. Soldiers who have stood the stress of battle without developing a psychiatric disability and the best soldiers in training are distinguished from their neurotic fellows by being stable, well adjusted and intelligent, with fewer and milder significant psychiatric stigmas.

6. Results of this study indicate that psychiatric screening standards at present employed are not too strict.

6. Kubie, L. S.: The Detection of Potential Psychosomatic Breakdowns in the Selection of Men for the Armed Forces, Ann. New York Acad. Sc. **44**: 605-624 (Dec. 22) 1943.

## ABSTRACT OF DISCUSSION

LIEUTENANT COLONEL J. D. GRIFFIN, R. C. A. M. C.: One essential problem facing the psychiatrist in his examination of recruits at the induction center concerns the answer to the question What are men being selected for? We are prone to think that our primary goal is to get the man through training, and so we select men for training. It is obvious that that is not the only goal of selection. The goal of the soldier is to fight, and so we must select for combat too, and that makes it pretty hard; for the man who is a good fighter and a good combat soldier is not necessarily also able to take the long dreary months of training, discipline, regimentation, education in the classroom sense and the separation from home and family and from his old job. There is another problem facing our psychiatrist. I refer to the unpleasant position the service and civilian psychiatrist finds himself in when he discovers that he is between the pressure of the politicians and the people at the top, who feel that the army is somehow not getting enough men, that the men already in are somehow melting away largely through the efforts of the psychiatrists, and on the other hand the pressure that comes from the training officers, the men in charge of the training camps, who say "You're doing a swell job, only do more of it. We don't want these fellows. They don't make good soldiers. Tighten your standards." There are six ways in which we try to keep our sights on the target. The first is that we use only service psychiatrists for screening recruits. All the psychiatrists in the induction centers are in the army. Secondly, we send the psychiatrists into the field frequently so that they may check up personally on the type of men they have let in. That makes it possible for them to reexamine after six to eight weeks of training many of the men whom they were rather doubtful of at the induction center. This is our so-called Accept for Recheck System. Our figures show that over 60 per cent of these men are making the grade as successful soldiers, which is a reasonable margin of error, I think. Thirdly, we have a social service organization in the army belonging to the medical corps, which checks the social and medical background of doubtful cases. We have had in addition an experimental project under way by which we are deliberately taking into the army through our induction centers men who would ordinarily be rejected because of instability. These men, a hundred of them, are at present in training with a modified training program stressing group psychotherapy and special indoctrination and educational procedures.

**Thomas Hodgkin.**—Thomas Hodgkin (1798-1866), after graduating in medicine at Edinburgh in 1823 and studying intensively in France and Italy, settled in practice in London and was appointed curator of the pathologic museum and demonstrator of pathology at Guy's Hospital, London. This was one of the first chairs of this particular subject to be created. Hodgkin held it for ten years and made many important studies of the pathologic collections. His paper on the diseases of the "absorbent glands and spleen" published in 1832 first described the disease which Wilks in 1865 named Hodgkin's disease. Hodgkin was noted for his philanthropic labors. He was a close friend of Sir Moses Montefiore, the Jewish philanthropist, and while traveling with Sir Moses in the Orient contracted dysentery and died at Joffa, where he is buried.—Clendening, Logan: Source Book of Medical History, New York, Paul B. Hoeber, Inc., 1942.

# THE USE OF PENICILLIN IN RHEUMATIC FEVER

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Although the etiology of rheumatic fever is not fully understood, current data indicate that attacks of this disease are generally preceded by infections with group A hemolytic streptococci. The sequence of events is so regular that one is justified in advancing the hypothesis that the streptococcic infection induces rheumatic fever. Whether group A streptococci are the only infectious agents responsible for rheumatic fever or whether they merely activate some other specific micro-organism or virus and possibly act in concert with it to produce the disease has not been determined. The temporal relationship between the hemolytic streptococcic infection and the attack of rheumatic fever is generally not immediate. In fact, the usual sequence of events is streptococcic infection, quiescent period, rheumatic fever. These phases have been designated as I, II and III respectively. It has been shown that if the initiating or inducing streptococcic infection, phase I, is prevented in susceptible subjects, then rheumatic fever fails to occur.[1] This is presumably the basis for the prophylaxis of rheumatic fever by the sulfonamides.

With these relationships in mind, it appeared rational to test the influence on the course of rheumatic fever of such a potent antistreptococcic agent as penicillin, for it must be admitted that the drug therapy to date is far from satisfactory. Salicylates, and such chemically unrelated drugs as aminopyrine and neocinchophen, appear to act in the tissues by altering their response to the "noxious agent" and not directly on the inducing agent, the hemolytic streptococcus. Penicillin, on the other hand, appears to exert its curative action by inhibiting the growth of certain pathogenic micro-organisms. If, then, the continuing symptoms of rheumatic fever are due to the persistence of hemolytic streptococci in the patient's tissues, it might be expected that complete removal of these micro-organisms by means of penicillin would favorably affect the course of this disease.

It is well established that sulfanilamide, which is known to be effective against hemolytic streptococcic infections, exerts no beneficial influence on rheumatic fever but often aggravates the symptoms when given during the active phase of the disease.[2] The sulfonamides, however, often do not completely eliminate hemolytic streptococci from patients with pharyngitis, tonsillitis or scarlet fever.[3] It therefore seemed desirable to test the effect on rheumatic fever of the more powerful antibacterial agent penicillin. Sufficient amounts of this drug were made available by Dr. Chester S. Keefer to study this problem, and the present report gives the details of this study.

## METHODS

Eight young men with typical acute rheumatic fever were each treated for two weeks with penicillin. During this period salicylates and other antirheumatic drugs were usually withheld as long as seemed justifiable. The changes in signs and symptoms were noted and charted daily as indicated in the case histories. In addition, leukocyte counts, erythrocyte sedimentation rates, nose and throat cultures, electrocardiograms and x-rays of the chest were taken at frequent intervals. Samples of blood were also obtained once a week for determination of antistreptolysin and antifibrinolysin titers and at various intervals after injections of penicillin to determine its concentration in the patient's serum.

The method of administering the penicillin was varied. Two patients received the drug intramuscularly at four hour intervals during the night and intravenously at three hour intervals during the day for two weeks. Four patients were treated in a like manner for the first week and then only by the intravenous route at three hour intervals from 9 a. m. through 12 midnight for the second week. The 2 remaining patients were given penicillin by the continuous intravenous drip method for one week and then intravenously at three hour intervals from 9 a. m. through 12 midnight during the second week. Because of the possible danger of precipitating cardiac failure in patients with acute rheumatic fever, we hesitated to employ the continuous drip intravenously for long periods and particularly to use large amounts of isotonic solution of sodium chloride. For the constant intravenous method 37,500 units was dissolved in 500 cc. of distilled water containing 5 per cent glucose or occasionally in isotonic solution of sodium chloride. The rate of delivery was 35 to 40 drops per minute or 500 cc. every four hours. The individual intravenous injections contained 40,000 units each except in 1 case, in which the dose was 25,000. The intramuscular injections invariably contained 25,000 units.

The Westergren method was used to determine the erythrocyte sedimentation rate.[4] The antistreptolysin determinations were made according to the method of Todd and modified as previously described;[5] the antifibrinolysin determinations were made according to the methods described by Tillett, Edwards and Garner and

From the United States Navy Research Unit at the Hospital of the Rockefeller Institute for Medical Research and the Hospital of the Rockefeller Institute for Medical Research.

The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutic and Other Agents of the National Research Council.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

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by Boisvert.[6] Representative colonies of all hemolytic streptococci recovered from these patients were grouped and typed by the precipitin technic [7] and tested in vitro for susceptibility to penicillin. These tests for susceptibility, as well as the determinations of serum concentrations of penicillin, were done by the dilution method described by Rammelkamp.[8] A standard strain of group A hemolytic streptococcus was used as a control in each experiment.[9] The samples of blood were defibrinated and stored in the ice box at 4 C. for twelve to twenty-four hours before the determinations were made. We have found that specimens of blood may be thus stored for as long as two weeks without demonstrable loss in the concentration of penicillin.

## REPORT OF CASES

CASE 1.—*History* (chart 1).—D. H., aged 23, was admitted on Jan. 8, 1944 on the sixth day of an attack of rheumatic fever. Two previous attacks had occurred when he was 11 and 12 years of age respectively. An upper respiratory infection on December 15 was followed in nineteen days by pain and swelling in the left foot, shoulder, wrist and both knees.

On admission the temperature was 102.2 F., the pulse rate 92 and the respiratory rate 24 per minute. Arthritis was present as charted. The heart was enlarged to the left by percussion. Auscultation revealed a systolic murmur at the apex and a diastolic blow at the base. The blood pressure was 128/65.

Laboratory examination on admission revealed red blood cells 3,610,000, hemoglobin 79 per cent, white blood cells 10,950, erythrocyte sedimentation rate 115 mm. per hour, cultures of the nasopharynx yielding no hemolytic streptococci, electrocardiogram essentially normal with a PR interval of 0.17 second, x-ray examination of chest disclosing heart enlarged in the region of the left ventricle.

*Course.*—Penicillin was started on the day of admission. During the first twenty-four hours the patient was given 25,000 units intramuscularly every four hours. For the next six days he was given 25,000 units intravenously every three hours during the day and 25,000 units intramuscularly at four hour intervals at night. During the second week he received daily six intravenous injections at three hour intervals from 9 a. m. through 12 midnight. A total of 1,975,000 units was given over the two week period. The temperature remained elevated throughout the period of penicillin therapy. The arthritis increased during the first week to involve as many as ten different joints and gradually diminished during the second week. Three days after penicillin treatment was started the erythrocyte sedimentation rate had increased to 128 mm. per hour. On the sixth day after the cessation of penicillin therapy it was 135 mm. per hour and moderate fever persisted. At this time the patient was started on salicylates, with a prompt drop in temperature to normal.

About three and one-half months after the onset of the attack the erythrocyte sedimentation rate became normal, but the signs of aortic and mitral insufficiency persisted. Convalescence thereafter was uninterrupted.

In this case there was no evidence that penicillin treatment altered the course of the disease. The patient appeared ill until placed under full therapeutic doses of salicylates. The persistence of an elevated erythrocyte sedimentation rate for over three months indicates that the course of the rheumatic fever had probably not been curtailed by the penicillin therapy.

CASE 2.—*History.*—M. K., aged 18, was admitted on Jan. 11, 1944 with his first attack of rheumatic fever. Early in December 1943 he developed a cold, which was followed about two weeks later by pain and stiffness in the hips and in the toes of both feet. These symptoms persisted intermittently and at times were severe but did not confine him to bed. On January 3 he developed pain, tenderness and swelling of the right ankle, and during the next six days both hips, knees, the left ankle and the foot became involved. On January 9 he was transferred to the U. S. Naval Hospital, Brooklyn, where erythema marginatum was noted over the trunk for only one day. During the two days in that hospital the patient received

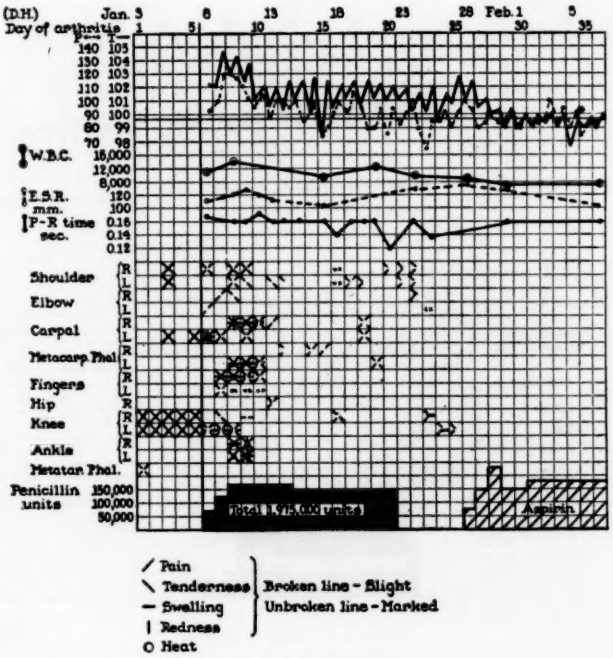


Chart 1.—Course in case 1.

about 3 Gm. of acetylsalicylic acid, with partial relief of symptoms. On the day of admission to the Rockefeller Hospital, stiffness in the right elbow was noted for the first time.

On admission the temperature was 100.4 F., pulse rate 80 and respiratory rate 20 per minute. The patient appeared acutely ill and had pallor of the skin and mucous membranes but no rash. There were pain and tenderness of the right elbow, the first interphalangeal joint of the left middle finger and both hips and slight tenderness over the left knee, ankle and the toes of the left foot. The right knee and ankle were painful, tender and swollen. The heart was at the upper limits of normal in size on percussion. A soft systolic murmur was heard along the left sternal border and a third sound at the apex early in diastole.

The blood pressure was 112/28.

On admission the laboratory examination revealed red blood cells 3,460,000, hemoglobin 74 per cent, white blood cells 9,400, erythrocyte sedimentation rate 128 mm. per hour, throat culture yielding group A type 24 hemolytic streptococci, electrocardiogram essentially normal with a PR interval of 0.13 second, x-ray examination of chest disclosing heart slightly enlarged in its transverse diameter.

6. Tillett, W. S.; Edwards, L. B., and Garner, R. L.: Fibrinolytic Activity of Hemolytic Streptococci: The Development of Resistance to Fibrinolysis Following Acute Hemolytic Streptococcus Infections, J. Clin. Investigation **13:** 47-78 (Jan.) 1934. Boisvert, P. L.: The Streptococcal Antifibrinolysin Test in Clinical Use, ibid. **19:** 65-74 (Jan.) 1940.

7. Lancefield, Rebecca C.: The Antigenic Complex of Streptococcus Hemolyticus: I. The Demonstration of a Type Specific Substance in Extracts of Streptococcus Hemolyticus, J. Exper. Med. **47:** 91-103 (Jan.) 1928; A Micro Precipitin Technic for Classifying Hemolytic Streptococci, and Improved Methods for Producing Antisera, Proc. Soc. Exper. Biol. & Med. **38:** 473-478 (May) 1938. Swift, H. F.; Wilson, A. T., and Lancefield, Rebecca C.: Typing Group A Hemolytic Streptococci by M Precipitin Reactions in Capillary Pipettes, J. Exper. Med. **78:** 127-133 (Aug.) 1943.

8. Rammelkamp, C. H.: A Method for Determining the Concentration of Penicillin in Body Fluids and Exudates, Proc. Soc. Exper. Biol. & Med. **51:** 95-97 (Oct.) 1942.

9. The Standard Strain of group A hemolytic streptococcus number 98 was kindly furnished us by Dr. Chester Keefer.

*Course.*—On January 12, the day after admission, penicillin therapy was started, and during the next fourteen days he received a total of 3,350,000 units by the intravenous and intramuscular routes. For the first four days the temperature gradually increased daily, so that by the fourth day of penicillin treatment it had reached 103.3 F. and the arthritis had progressed to involve practically every joint in the body. During the next six days the fever gradually dropped to 99.3 F. and the arthritis receded, so that by the tenth day of penicillin therapy only slight pain in the right shoulder, elbow and fingers of both hands was present. The erythrocyte sedimentation rate, however, was 95 mm. per hour. During the next four days, while the patient was still receiving penicillin, the fever and moderate arthritis recurred. Following the cessation of penicillin on January 26 he continued to improve; the temperature again gradually fell to normal, the arthritis receded slowly and the erythrocyte sedimentation rate declined to 45 mm. per hour by February 11. During the first week of penicillin therapy he developed a short systolic murmur at the apex, which disappeared again as he improved otherwise. The PR interval increased from 0.13 second on admission to

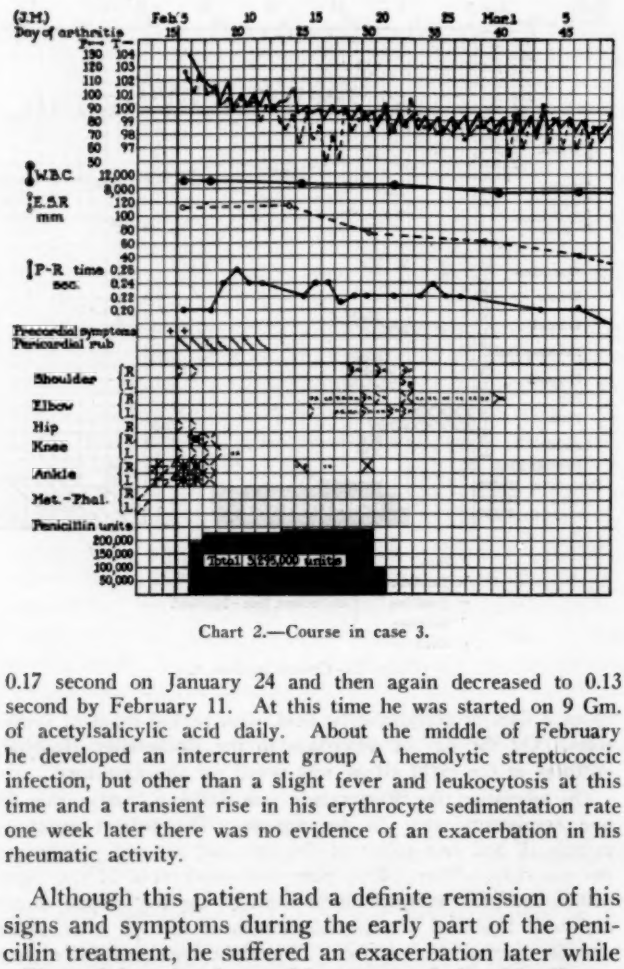


Chart 2.—Course in case 3.

0.17 second on January 24 and then again decreased to 0.13 second by February 11. At this time he was started on 9 Gm. of acetylsalicylic acid daily. About the middle of February he developed an intercurrent group A hemolytic streptococcic infection, but other than a slight fever and leukocytosis at this time and a transient rise in his erythrocyte sedimentation rate one week later there was no evidence of an exacerbation in his rheumatic activity.

Although this patient had a definite remission of his signs and symptoms during the early part of the penicillin treatment, he suffered an exacerbation later while still receiving the drug; this suggested that his disease was running a polycyclic course. Moreover, he still had signs of active infection when salicylates were started fifteen days after penicillin was stopped; and following the discontinuance of salicylate three months later, the erythrocyte sedimentation rate again became elevated, indicating persistent rheumatic activity.

CASE 3.—*History* (chart 2).—J. M., aged 31, was admitted on Feb. 5, 1944 on the sixteenth day of an attack of rheumatic fever. A previous attack of polyarthritis, probably due to rheumatic fever, lasting three to four weeks had occurred in August 1929. A mild sore throat on Jan. 7, 1944 was followed in two weeks by pain and stiffness in both ankles. The day prior to entry, substernal pressure was noted.

On admission the temperature was 103.9 F., the pulse rate 116, and respiratory rate 22 per minute. The right shoulder, hip and left knee were painful and tender. Both ankles were painful, tender, swollen, red and hot. The heart was slightly enlarged by percussion, and at the base a rough coarse, leathery sound was heard throughout systole. The blood pressure was 120/80.

The laboratory examination on entry revealed red blood cells 4,150,000, hemoglobin 79 per cent, white blood cells 10,450, erythrocyte sedimentation rate 119 mm. per hour, cultures of nasopharynx yielding many group A type 17 hemolytic streptococci, electrocardiogram essentially normal with a PR interval of 0.20 second and a rate of 120 per minute, x-ray examination of chest disclosing slight enlargement of the heart in its transverse diameter.

*Course.*—Penicillin, started the day after admission, was given by continuous intravenous drip for the first week and by the interrupted intravenous method during the second week. He received a total of 3,295,000 units during the two weeks of treatment. During the first twenty-four hours after admission the arthritis progressed to involve the right knee and then gradually receded during the next few days, so that by the fifth day of penicillin treatment the patient was asymptomatic with the exception of epistaxes. The erythrocyte sedimentation rate, however, remained high and he developed first degree heart block, which persisted until twelve days after the discontinuance of penicillin. On the ninth day of penicillin therapy mild arthritis recurred involving the knees, elbows and shoulders and persisted until nine days after this drug was stopped. By this time the patient was afebrile and the erythrocyte sedimentation rate had decreased to 65 mm. per hour. His convalescence was uneventful thereafter.

Although it is difficult to evaluate the effect of penicillin in this case, it would appear that this patient had a rather mild attack of rheumatic fever with a single cycle of activity so often seen in persons of this age group.

CASE 4.—*History.*—H. P., aged 24, was admitted on January 14, 1944 with his first attack of rheumatic fever. On December 18 he developed a sore throat. Two days later, pain was first noticed in the left hip and foot and subsequently in both feet and knees. During the next fortnight the joint pains spontaneously subsided, and he felt well for about five days. On January 9 he again developed pain in both feet, and two days later his ankles became swollen. On the day before admission both knees became swollen and painful, and slight precordial discomfort was noticed.

On admission the temperature was 103.4 F., pulse rate 106, and respiratory rate 26 per minute. The patient appeared acutely ill. Both elbows were slightly painful. The knees, ankles and metatarsophalangeal joints of both feet were painful, tender, swollen, red and hot. The heart was at the upper limits of normal in size to percussion and there was a low pitched systolic murmur at the apex and a soft systolic blow along the left sternal border.

The blood pressure was 134/75.

The laboratory examination on admission revealed red blood cells 4,670,000, hemoglobin 73 per cent, white blood cells 12,150, erythrocyte sedimentation rate 80 mm. per hour, cultures of the nasopharynx yielding group A type 30 hemolytic streptococci, electrocardiogram showing normal rhythm, rate 110 per minute, PR interval 0.20 second, $T_1$ upright, $T_2$ diphasic, $T_3$ negative and $RT_2$ segment elevated, x-ray examination of the chest disclosing the heart normal in size and shape.

*Course.*—On the day after admission penicillin therapy was started. During the first week the patient received 40,000 units intravenously at three hour intervals during the day and 25,000 units intramuscularly at four hour intervals during the night. Following the institution of penicillin treatment, the

patient's arthritis involved progressively the right hand, wrist, both elbows, shoulders and the sternoclavicular and acromioclavicular joints. On the sixth day after starting treatment the erythrocyte sedimentation rate had reached 112 mm. per hour. His polyarthritis then rapidly cleared and the temperature fell to a normal level. During the second week the patient received 40,000 units of penicillin every three hours from 9 a. m. through 12 midnight. During this time the temperature did not exceed 100 F., the arthritis was much improved and the erythrocyte sedimentation rate decreased to 30 mm. per hour. Nine days after discontinuance of the penicillin he was afebrile, his white blood cell count was within the limits of normal and the erythrocyte sedimentation rate had decreased to 15 mm. per hour. He continued, however, to have some pain and tenderness in both elbows. Two days later pain recurred in both hips and the right knee and during the next forty-eight hours progressed to involve the spine and the left knee. He again became febrile; the white blood cells and the erythrocyte sedimentation rate increased. At this time 9 Gm. of acetylsalicylic acid was given daily, which induced a prompt disappearance of fever and arthritis except for slight pain and tenderness in the elbows which persisted for several weeks, although the erythrocyte sedimentation rate and white blood cells rapidly fell to normal levels.

As indicated by the history and hospital course, this patient's disease was probably polycyclic in type. Penicillin therapy was apparently started during the second cycle of activity, and the remission which occurred during the latter part of the treatment probably represented the natural course for his disease. The recurrence in activity following the cessation of penicillin treatment indicates that this drug was not effective in curing the rheumatic fever.

CASE 5.—*History.*—W. W., aged 20 years, admitted on March 1, 1944, had postscarlatinal arthritis when 14 years old and for many years had suffered attacks of paroxysmal tachycardia. About February 1 he developed nasopharyngitis. Three weeks later, and one week prior to his admission, pain in both feet, ankles and elbows occurred. On the day before admission the hips and shoulders became involved, swelling of the left knee appeared and substernal discomfort was noticed.

On admission the temperature was 101.4 F., pulse rate 96 and respiratory rate 28 per minute. The patient appeared moderately ill. The elbows, hips and knees were painful and there were small effusions in both knee joints. The left foot and ankle were tender, painful and hot. Examination of the chest revealed slight dulness, with a moderate number of moist rales below the angle of the right scapula. The heart was slightly enlarged to percussion and there was a soft systolic murmur along the left sternal border. The blood pressure was 105/60.

The laboratory examination on admission revealed red blood cells 3,870,000, hemoglobin 84 per cent, white blood cells 11,250, erythrocyte sedimentation rate 47 mm. per hour, cultures of the nasopharynx yielding group A type 19 hemolytic streptococci, electrocardiogram showing left bundle branch block with a PR interval of 0.12 second, x-ray examination of the chest disclosing peribronchiolar infiltration at the right base, and the heart slightly enlarged in its transverse diameter.

*Course.*—On March 2, the day after admission, penicillin therapy was started and during the next two weeks he was given 40,000 units intravenously at three hour intervals during the day and 25,000 units intramuscularly at four hour intervals at night. During the two weeks of treatment he received a total of 3,404,000 units of penicillin. On March 3 the polyarthritis had increased and the erythrocyte sedimentation rate was 52 mm. per hour. It was therefore decided to give him enough salicylates to eliminate the fever and to render him asymptomatic and then withdraw this drug while he was receiving continuous penicillin therapy; hence he was given 1.5 Gm. of acetylsalicylic acid every four hours for three days. Within eight hours after this treatment was started the temperature returned to normal, and within twenty-four hours he was asymptomatic. When the salicylates were discontinued, however, no rheumatic manifestations reappeared and he made an uneventful convalescence. Except for minor changes in the form of the complexes, his electrocardiograms remained essentially unchanged. It was felt that this electrocardiographic abnormality was not related to his rheumatic fever but that the patient probably suffered from the syndrome described by Wolff, Parkinson and White.[10]

This patient apparently suffered a mild attack of rheumatic fever with a single cycle of activity which was broken by the salicylate therapy; hence it is very difficult to appraise the value of the penicillin treatment.

CASE 6.—*History* (chart 3).—J. C., aged 20 years, was admitted on Feb. 4, 1944 on the eighth day of a second attack of rheumatic fever. At the age of 9 he had an attack of polyarthritis. About four weeks and again one week prior

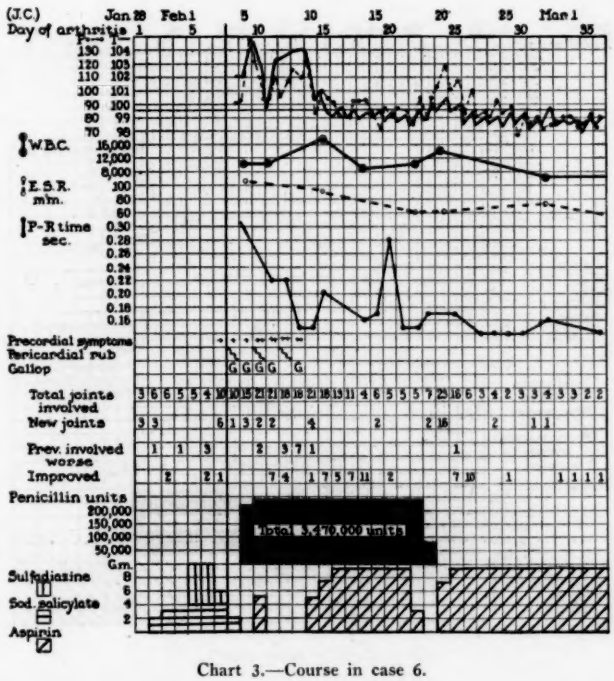


Chart 3.—Course in case 6.

to his present illness he suffered upper respiratory infections with slight fever and malaise. During the week before admission he had migratory polyarthritis involving the feet, ankles, knees, hips, spine and shoulders. He was given 18 Gm. of sodium salicylate and 8 Gm. of sulfadiazine during the six days prior to hospital admission.

On admission the temperature was 102 F., pulse rate 92 and respiratory rate 24 per minute. The patient appeared acutely ill. The right elbow and shoulder were painful and there was slight stiffness of the left elbow. There was pain and tenderness over the right acromioclavicular joint and both hips. Both knees were red, tender, swollen and hot, and the right ankle and the metatarsophalangeal joints of both feet were painful and tender. The heart was slightly enlarged to the left, and at the apex a third sound was heard early in diastole but no murmurs were present. Along the left sternal border there was a definite pericardial friction rub. The blood pressure was 120/70.

The laboratory examination on admission revealed red blood cells 3,790,000, hemoglobin 78 per cent, white blood cells 11,050,

10. Wolff, L.; Parkinson, J., and White, P. D.: Bundle Branch Block with Short PR Interval in Healthy Young People Prone to Paroxysmal Tachycardia, Am. Heart J. **5**: 685-704 (Aug.) 1930.

erythrocyte sedimentation rate 111 mm. per hour, cultures of nasopharynx yielding group A type 19 hemolytic streptococci, electrocardiogram showing first degree heart block with PR interval greater than 0.32 second, x-ray examination of the chest disclosing accentuated lung markings with a small amount of fluid in the left costophrenic angle, the heart being slightly enlarged in its transverse diameter.

*Course.*—On the day after admission, penicillin therapy was started with five intravenous injections of 40,000 units each every three hours during the day and two intramuscular injections of 25,000 units at four hour intervals at night, making a total of 250,000 units daily for the first week. During the second week he was given six injections of 40,000 units intravenously daily. Over the fourteen day period he received 3,470,000 units of penicillin. Within thirty-two hours after penicillin was started the patient's temperature had reached 104.7 F. and the arthritis had progressively involved practically every joint. Therefore 4.8 Gm. of acetylsalicylic acid was given over a period of nine hours, which induced a drop in the temperature to 99.6 F., with definite symptomatic relief. Within twenty-four hours after the salicylates had been discontinued,

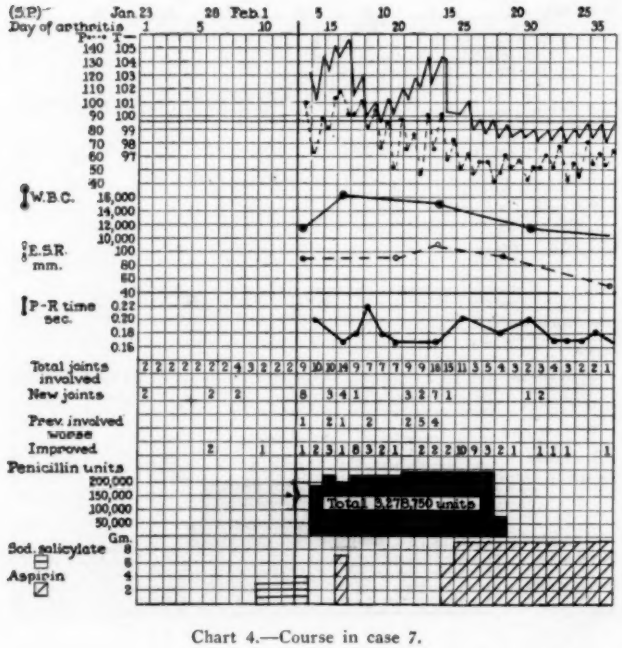


Chart 4.—Course in case 7.

however, the temperature returned to 103.4 F. and all joint manifestations recurred despite continued penicillin therapy. During the next two and one-half days the high fever and severe polyarthritis persisted. On the sixth day of penicillin therapy 4.8 Gm. of acetylsalicylic acid gave only slight relief, and on the next day the dose was increased to 9 Gm. daily with a prompt drop in temperature and relief of symptoms. This dose daily for the next six days kept the temperature below 100 F. and the arthritis in abeyance. A second withdrawal of salicylates on February 18, while the patient was still receiving penicillin, resulted in a recurrence of both fever and polyarthritis within twenty-four hours. By this time he had received a total of 3,470,000 units of penicillin without apparent benefit; hence this drug was discontinued, and the daily dose of 9 Gm. of acetylsalicylic acid was resumed with another prompt drop in the temperature and relief of symptoms. This medication was then continued for approximately nine weeks, about two weeks after all laboratory data had become normal. His subsequent convalescence was unremarkable.

It is clear that each time this patient received salicylates in sufficient dosage he obtained promp symptomatic relief, but on withdrawal of salicylates while he was on continuous penicillin therapy all signs and symptoms of rheumatic activity promptly recurred. It therefore appeared that his disease was not altered by the penicillin.

Case 7.—*History* (chart 4).—S. P., aged 21, was admitted on Feb. 4, 1944, the thirteenth day of his first attack of rheumatic fever, which had been preceded by upper respiratory infections on Dec. 7, 1943 and Jan. 15, 1944. Although several episodes of epistaxis had occurred on December 26 and 27, pain in the arches of his feet first appeared on January 23, forty-eight days after the first and eight days after the second upper respiratory infection. The pain increased progressively during the next eleven days and involved also the ankles and knees. The patient had received 13 Gm. of sodium salicylate during the four days prior to hospitalization.

When admitted he appeared acutely ill, with a temperature of 103.2 F., pulse rate 100 and respiratory rate of 22 per minute. There were stiffness in the shoulders, elbows and wrists and slight pain and tenderness over the lower dorsal and upper lumbar spine. The right knee and ankle were painful, tender, swollen and hot. There was a small effusion in the right knee. The heart was slightly enlarged to the left and a soft prolonged, low pitched systolic murmur localized to the apex was present. The blood pressure was 120/75.

The laboratory examination on admission revealed red blood cells 3,930,000, white blood cells 10,950, erythrocyte sedimentation rate 87 mm. per hour, cultures of nasopharynx yielding group A type 36 hemolytic streptococci, electrocardiogram being essentially normal with a PR interval of 0.20 second, x-ray examination of the chest disclosing the heart enlarged in the region of the left ventricle.

*Course.*—On February 5, the day after admission, penicillin therapy was started with approximately 250,000 units daily by the continuous intravenous drip. Because of thrombophlebitis this form of treatment was discontinued after the first week, and during the second week the penicillin was given intravenously every three hours. He received a total of 3,278,750 units during the two week period. Forty-eight hours after penicillin was started the temperature had reached 105 F. and the polyarthritis had increased in severity. Because of the hyperpyrexia he was given 6.4 Gm. of acetylsalicylic acid over a period of nine hours with prompt symptomatic relief and drop in temperature. Following the withdrawal of salicylates the fever recurred, and polyarthritis again increased in severity despite continuous penicillin therapy.

On the sixth hospital day, the electrocardiogram showed first degree heart block with a PR interval of 0.22 second, and on the next day the T waves in leads 1 and 2 became inverted. On the tenth day of penicillin treatment the erythrocyte sedimentation rate had increased to 111 mm. per hour, the temperature was 104 F. and severe polyarthritis was present. On the following day the patient developed temporary nodal rhythm with intraventricular heart block. Because it seemed unwise to withhold salicylates longer he was started on 9 Gm. per day, with a prompt drop in the temperature and pronounced symptomatic relief. Salicylates were continued in this dosage for six weeks, when the erythrocyte sedimentation rate reached a normal level. Attempts were then made to reduce the dose of salicylates, but pain and tenderness recurred in both shoulders and it was necessary to return to the original dose to keep the patient comparatively symptom free for another two months. It thus seems probable that the penicillin failed to alter the course of this patient's disease.

Case 8.—*History* (chart 5).—N. L., aged 21, was admitted March 2, 1944, on the fourth day of an attack of rheumatic fever. Nasopharyngitis on February 12 was followed in sixteen days by severe pain in both shoulders and substernal pressure. Arthritis then progressively involved both elbows, hips, knees and ankles.

On admission the temperature was 104 F., pulse rate 120 and respiratory rate 28 per minute. Pain and tenderness were noted in the right sternoclavicular joint, both shoulders, elbows, knees, ankles and the right hip. The heart was enlarged to

the left. At the apex a presystolic thrill was felt and a low pitched murmur was heard late in diastole. A systolic murmur, poorly transmitted to the axilla, was also present. The first sound at the apex was snapping in character, and at the base the pulmonic second sound was accentuated and greater than the aortic second sound. The blood pressure was 120/70.

The laboratory examination at entry revealed red blood cells 3,670,000, hemoglobin 74 per cent, white blood cells 13,650, erythrocyte sedimentation rate 118 mm. per hour, cultures of the nasopharynx yielding no hemolytic streptococci, electrocardiogram showing normal rhythm, rate 115 per minute, PR interval 0.20 second, $T_1$ upright, $T_2$ diphasic, $T_3$ upright; x-ray examination of the chest disclosing the heart enlarged in its transverse diameter with a straight left border and prominent pulmonary conus, the lungs with hilar vascular shadows enlarged, suggesting pulmonary congestion.

*Course.*—Although the patient gave no previous history of rheumatic fever, the classic signs of mitral stenosis indicated earlier experience with the disease. Because of the severity of the attack and the early signs of cardiac failure, the patient was started on 9 Gm. of acetylsalicylic acid daily on admission. Penicillin therapy was started on the day after admission with intravenous injections of 40,000 units every three hours during the day and intramuscular injections of 25,000 units every four hours at night. The patient received a total of 3,390,000 units of penicillin during the two weeks of treatment. On the first day of penicillin therapy pulmonary edema appeared, hence the patient was digitalized rapidly, given a diet containing 2 Gm. of salt daily with limited fluids, and placed in an oxygen chamber. The signs and symptoms of cardiac failure responded quickly to this regimen. Because of mild salicylism, aminopyrine was substituted for acetylsalicylic acid on the fourth hospital day and was well tolerated in daily doses of 4.5 Gm. Following the institution of salicylate therapy and then aminopyrine, the temperature fell to normal, the pulse rate slowed and the arthritis decreased definitely. During the second week of penicillin therapy, however, the arthritis increased in severity and several new joints became involved. This cycle of polyarthritis persisted during the week following cessation of penicillin, then decreased; but a third arthritic cycle occurred a few weeks later and a suggestive one a month later while the patient was receiving full doses of aminopyrine. The high erythrocyte sedimentation rate began to decrease in about three weeks and reached normal six weeks after discontinuance of penicillin treatment. The patient's condition began to improve at this time and the weight to increase; convalescence was well established, with only slight pain, tenderness, and stiffness remaining in a few joints. Signs of both mitral stenosis and insufficiency remained; but whether they were more evident than before the present attack of rheumatic fever it is impossible to state.

While the necessity for both antirheumatic medication and digitalis in this patient may have obscured the effect of penicillin, the cycles of arthritis both during and after penicillin therapy indicated that this drug had little if any effect on the course of the patient's disease.

### ADDITIONAL OBSERVATIONS

Samples of blood were taken of all patients at varying intervals after the injection of penicillin to determine the concentration of the drug in the patient's serum. These samples were obtained at various times during the periods of treatment, so that the one-half hour level may have been determined on one day, the one hour level on another day, and so on. The variation in the rate of excretion of penicillin from day to day in the same individual probably accounts for the fact that in case 7 in the table the one-half hour, one hour and two hour blood levels were the same, and in case 3 the two hour and three hour blood levels were similar. In addition, the strains of group A hemolytic streptococci recovered on culture from the nasopharynx of 6 of the 8 patients were tested for their susceptibility to penicillin in vitro. The results of these tests and a summary of the serum concentration of penicillin obtained on each patient are presented in the table. From these data it is apparent that all of the hemolytic streptococci recovered were susceptible to penicillin in concentrations much below the concentration maintained in the patient's blood serum during most of the period of treatment.

It may also be significant that the nasopharyngeal cultures of the 6 patients that were positive for group A hemolytic streptococci on admission became negative for these micro-organisms within a very short time after treatment with penicillin was started and remained negative after this drug was stopped. It is realized that this does not necessarily indicate that streptococci in deeper tissues such as the cervical lymph nodes were completely eliminated by the therapy.

Determinations of the antistreptolysin O and antifibrinolysin titers were made on the serum and plasma

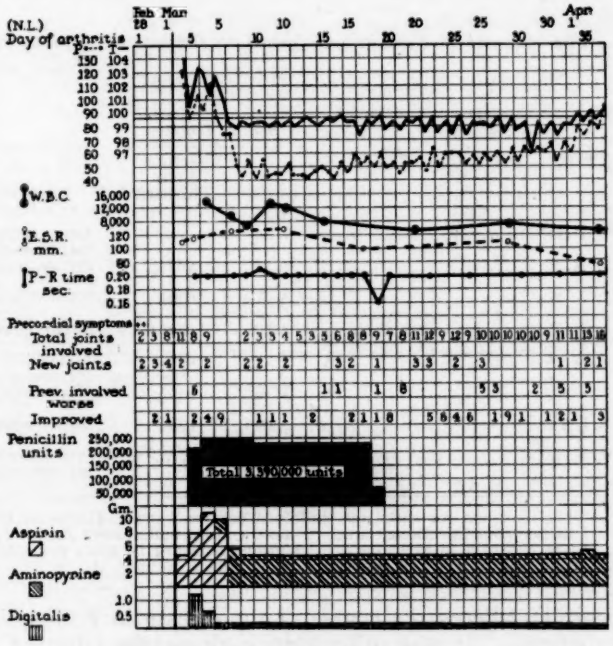


Chart 5.—Course in case 8.

respectively of all patients at weekly intervals during the course of study. The titration curves for both determinations followed courses similar to those that might have been expected among any 8 untreated rheumatic fever patients. The antistreptolysin O titers initially ranged between 100 and 1,200 units and in most instances increased moderately during the first one to two weeks of penicillin therapy and then remained stationary or began to fall slowly; but they usually persisted in an abnormal zone for several months. The antifibrinolysin titers of all the patients were 3 to 4 plus at the time of admission and usually remained elevated for several months.

In none of the 8 patients treated were any definite toxic manifestations to penicillin observed. Both patients 3 and 7, who received the drug by the constant intravenous drip method, developed mild thrombophlebitis. We do not believe, however, that this was necessarily due to the penicillin; it may have been due in part to the glucose solution, as previously pointed

out by Herrell.[11] Thrombophlebitis was not observed in any of the patients receiving more concentrated solutions of penicillin in isotonic solution of sodium chloride by vein at three hour intervals.

## COMMENT

Eight young men with rheumatic fever have been treated for a two week period during the acute phase of their disease with penicillin. The total dose of penicillin varied from 1,975,000 to 3,470,000 Oxford units, and 7 of the 8 patients received over 3,000,000 units. The routes of administration were varied. Six of the 8 patients received the drug by the intramuscular and intravenous routes intermittently. The remaining 2 were given penicillin by constant drip for one week and then by the intermittent intravenous method for the second week.

All the patients were acutely ill with elevated temperatures and acute polyarthritis and, in addition, 2 of them had pericarditis and 1 developed pulmonary edema the day after admission. There was no evidence that penicillin altered the course of the disease in 7 of the 8 patients. It was difficult to evaluate the effect of this drug in the remaining subject (patient 5). On the second day of penicillin treatment he was started on 9 Gm. of salicylates daily with the object of rendering him afebrile and asymptomatic and then of withdrawing this drug while he was receiving continuous penicillin therapy. This patient made a prompt symptomatic response to salicylates but on withdrawal of this drug the signs and symptoms of rheumatic activity failed to recur; his erythrocyte sedimentation rate dropped to normal and he made an uneventful recovery.

It is now generally conceded that infection with group A hemolytic streptococci usually precedes and probably initiates the attack of rheumatic fever. It moreover appears possible that the hemolytic streptococcus is the only infectious agent involved in the etiology of the disease and that persistence of these micro-organisms in the patient's tissues may be responsible for the continued signs and symptoms of rheumatic activity. It was therefore desirable to know whether the dose of penicillin used was adequate to maintain in the patient's blood a drug concentration greater than that required to inhibit the growth of the patient's own strain of streptococcus.

On admission to the hospital group A hemolytic streptococci were isolated on culture from the nasopharynx of 6 of the 8 patients. It was shown that 0.015 Oxford unit completely inhibited the growth of all 6 of these strains when this amount of penicillin was added to a culture containing from 1,000 to 5,000 bacterial cells. It was also shown that the concentrations of penicillin maintained in the patients' blood during most of the period of treatment were many times that required to inhibit the growth of the streptococci isolated from these patients. Another indication that the dose of penicillin was adequate is that the group A hemolytic streptococci were eliminated permanently from the nasopharyngeal mucous membrane of these patients within a short time after beginning treatment.

Whether or not penicillin would be effective in preventing rheumatic fever if given during phase I or II cannot be answered as yet; but we do know that the sulfonamides are ineffective in this respect even when given at the onset of phase I. Until the foregoing question can be answered it seems that the chief value of the antibacterial drugs today with respect to rheumatic fever is in the prevention of the streptococcic infection which appears to induce the disease. It would thus seem that, once the preliminary streptococcic infection has started the mechanism leading to the onset of the rheumatic process in susceptible persons, the antibacterial agents now available do not materially alter the evolution of that mechanism. It must be admitted that we have no conclusive evidence that deep seated foci of streptococci may not exist in these patients in spite of their receiving large enough doses of penicillin to remove them from the accessible mucous membranes; for persistence of these micro-organisms could theoretically be responsible for the continued rheumatic activity.

*The Amount of Penicillin Required to Inhibit the Growth of Streptococci Isolated from Patients and the Concentration of Penicillin in Their Serum*

| Case | Strains Isolated: Group Type | Strains Isolated: Oxford Units Inhibiting Growth* | Route of Injection † | Serum Concentrations of Penicillin * Oxford Units per Cubic Centimeter: Time After Injection: ½ Hr. | 1 Hr. | 2 Hr. | 3 Hr. | 4 Hr. | During Intravenous Drip ‡ |
|---|---|---|---|---|---|---|---|---|---|
| 1. D. H. | ..... | ..... | Intravenous | 0.156-0.624 | 0.156 | 0.078 | ..... | ..... | ..... |
| | | | Intramuscular | 0.624 | ..... | ..... | ..... | ..... | ..... |
| 2. M. K. | A 24 | 0.015 | Intravenous | 0.312 | ..... | 0.078 (1½ hr.) | <0.031 | ..... | ..... |
| 3. J. M. | A 17 | 0.015 | Intravenous | 0.624 | 0.078 | 0.031 | 0.031 | ..... | 0.156 |
| 4. H. P. | A 30 | 0.015 | Intravenous | 0.624 | 0.156 | 0.078 | 0.078-0.031 | ..... | ..... |
| 5. W. W. | A 19 | 0.015 | Intravenous | 0.312 | 0.156 | 0.031 | <0.031 | ..... | ..... |
| | | | Intramuscular | ..... | 0.156 | 0.078 | <0.031 | <0.031 | ..... |
| 6. J. C. | A 19 | 0.015 | Intravenous | 0.624 | 0.312 | 0.156 | <0.031 | ..... | ..... |
| 7. S. P. | A 36 | 0.015 | Intravenous | 0.624 | 0.624 | 0.624 | 0.078 | ..... | 0.156-0.624 |
| 8. N. L. | ..... | ..... | Intravenous | 0.312 | 0.156 | 0.078 | <0.031 | ..... | ..... |
| | | | Intramuscular | ..... | 0.156 | 0.078 | 0.031 | <0.031 | ..... |

* The inoculum for each test contained between 1,000 and 5,000 bacterial cells.
† Intravenous injections contained 40,000 Oxford units except in case 1, in which the dose was 25,000. Intramuscular injections contained 25,000 units.
‡ The constant intravenous drip solution contained 7.5 units per cubic centimeter and was regulated so that each patient received approximately 3,000 cubic centimeters in a twenty-four hour period.

## CONCLUSION

Penicillin in doses ranging from 1,975,000 to 3,470,000 Oxford units given over a two week period to 8 young adults with acute rheumatic fever apparently failed to alter the course of their disease.

11. Herrell, W. E.: The Clinical Use of Penicillin, an Antibacterial Agent of Biologic Origin, J. A. M. A. **124**: 622-627 (March 4) 1944.

# THE TREATMENT OF ACUTE RHEUMATIC FEVER WITH PENICILLIN

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The probable relationship of Lancefield group A hemolytic streptococcic disease to rheumatic fever has led to the therapeutic trial of various antistreptococcic substances in this disease. Swift [1] and Jones [2] have described the effects of sulfanilamide in acute rheumatic fever. Swift [3] and his co-workers [4] have also reported the results of streptococcic antiserums in this disease. Both of these entirely unrelated substances were found to be of no therapeutic value, and the evidence is suggestive that at times they may have been harmful. In view of these observations, when penicillin became available there was little cause for optimism that it would be beneficial in this disease.

However, because of the great need for a more satisfactory therapeutic agent for rheumatic fever and the knowledge that the value of penicillin in this disease would eventually need to be determined, it was felt that an organized study by producing an answer quickly and economically would, irrespective of the outcome, ultimately prove worth while.

## ORGANIZATION OF THE STUDY

Three army air force installations having high incidence rates for acute rheumatic fever and representing three geographic areas were selected. At each of the three posts the same plan of study was followed. Patients selected for penicillin therapy were those who had characteristic joint disease and who presented sufficient additional evidence of rheumatic fever to make them entirely acceptable from a diagnostic standpoint. Patients were not included who had previously received salicylates or sulfonamides. Some were treated as soon as the diagnosis was made, and the remainder after a period of observation of two or three days. Routine blood studies and urinalyses were done. Erythrocyte sedimentation rates were obtained every other day and electrocardiograms every second or third day. A careful record was kept of changes in objective and subjective evidences of the disease. Throat cultures were made at frequent intervals in the majority of the cases.

## PENICILLIN DOSAGE USED

Penicillin was administered intramuscularly in doses of 25,000 units at three hour intervals for daily dosage of 200,000 units. In the majority of instances this dosage was continued for five days or until a total of 1 million units had been administered. The dosage was thus twice that ordinarily acceptable for the usual forms of beta hemolytic streptococcic infections.

## INTERPRETATION OF RESULTS

Thirty-eight cases were studied. In 3 cases, because of the progression of the disease, the welfare of the patient made it necessary to stop penicillin and substitute salicylates before the completion of the five day period. The clinical impressions of the three groups of observers regarding the results of penicillin therapy are indicated in the accompanying table. A review of the recorded data reveals no consistent pattern which could be attributed to penicillin therapy. In the group of patients in whom the severity of the disease increased during penicillin therapy it was the opinion of the majority of investigators that penicillin was a contributory factor in this change. The possibility that this represents the natural course of the untreated disease in these individuals cannot be excluded. The single case in which improvement appeared following penicillin treatment may similarly represent a spontaneous recovery not infrequently observed in the monocyclic form of the disease.

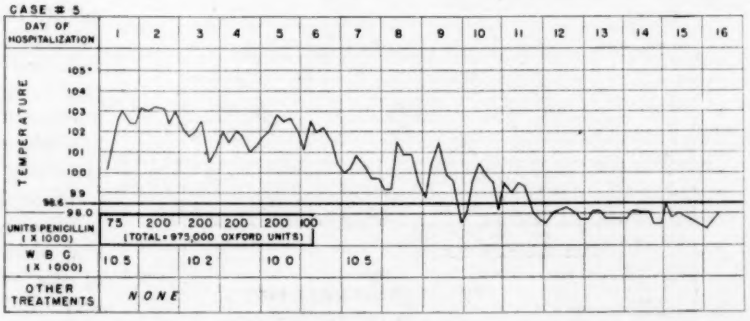


Chart 1.—Acute rheumatic fever penicillin therapy given during a period of gradual improvement. Cessation of the drug produced no apparent change in the clinical course of the disease.

*Clinical Evaluation of the Results of Penicillin Therapy in Acute Rheumatic Fever*

| AAF Hospital | No Change | Increased Severity | Improved |
|---|---|---|---|
| A | 5 | 5 | 0 |
| B | 3 | 4 | 1 |
| C | 11 | 9 | 0 |
| | 19 | 18 | 1 |

There were no changes in the electrocardiograms which could not be explained by the course of the disease. In 7 instances the erythrocyte sedimentation rate showed a temporary depression during the period of penicillin therapy. This has been observed also in other patients receiving conventional treatment. Two representative cases are illustrated in the accompanying graphs.

## BACTERIOLOGIC STUDIES

In 21 cases throat cultures were taken on admission and one or more times during penicillin therapy. The initial culture in 19 was found to be positive for group A

From the Army Air Forces Rheumatic Fever Control Program, AAF Regional Station Hospitals at Buckley Field, Colorado (Majors Foster and McEachern), Kearns, Utah (Captain Miller and Lieutenant Colonel Ball), and Truax Field, Wisconsin (Lieutenant Colonel Higley and Major Warren).

1. Swift, H. F.; Moen, J. K., and Hirst, G. K.: Action of Sulfanilamide in Rheumatic Fever, J. A. M. A. **110:** 426-434 (Feb. 5) 1938.
2. Massell, B. F., and Jones, T. D.: Effect of Sulfanilamide on Rheumatic Fever and Chorea, New England J. Med. **218:** 876-878 (May 26) 1938.
3. Swift, H. F.: Conferences on Therapy; Treatment of Rheumatic Fever, New York State J. Med. **42:** 895-903 (May 1) 1942.
4. Hitchcock, C. H.; McEwen, C., and Swift, H. F.: Am. J. M. Sc. **180:** 497-514 (Oct.) 1930.

hemolytic streptococci. In all instances the throat cultures became negative for this micro-organism during penicillin therapy. Seven patients were subsequently followed by serial throat cultures. In 1, the throat culture again became positive before penicillin therapy was terminated, in 1 case two days after termination and in the remaining 5 four weeks after termination. The hemolytic streptococci recovered at this time in the latter group of 5 patients were found to belong to different types than were found at the initial examination.

### COMPLICATIONS

Urticaria appeared in 4 cases, lasting an average of three and three fourths days and appearing an average of fourteen days after penicillin therapy was started. Three of these episodes of urticaria were followed by increased joint pains and elevation of the pulse rate and temperature.

### INITIAL ONSET OF ACUTE RHEUMATIC FEVER DURING PENICILLIN THERAPY

In addition to the cases described in which the therapeutic effect of penicillin in rheumatic fever was studied, 2 patients were observed who developed characteristic manifestations of acute rheumatic fever during the course of penicillin therapy for severe group A

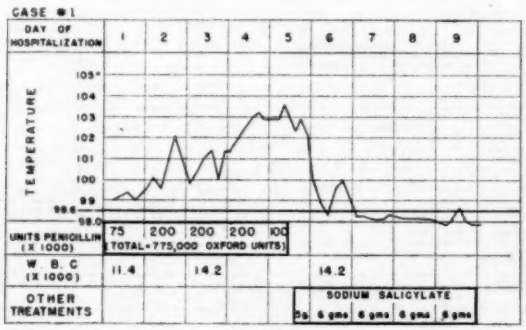


Chart 2.—Acute rheumatic fever progression of clinical disease during period of penicillin therapy, with prompt remission following a substitution of sodium salicylate.

hemolytic streptococcic infections. In these cases the joint manifestations developed two and four days respectively after the initiation of penicillin therapy and thus contrast to the allergic joint manifestations described. It therefore appears evident that penicillin exerts no beneficial influence in rheumatic fever when given after the establishment of the hemolytic streptococcic infection that apparently induces that disease.

### CONCLUSIONS

1. A study of the value of penicillin therapy in 38 cases of acute rheumatic fever disclosed no evidence of benefit.

2. In some cases it appeared clinically that the course of the disease was aggravated.

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• **Special Diabetic Food.**—Special foods for the diabetic patient are seldom necessary. On the contrary, the effort today is to permit the patient as far as possible to eat the ordinary foods which come to the table, which, with the more liberal carbohydrate diets now in use and with the aid of insulin, is not difficult. There are the further objections that, while specially prepared diabetic foods are sometimes attractive, they are often unpalatable and they vary greatly in percentage composition. The claims made for them are sometimes misleading, and as a rule they are expensive.—McLester, James S.: Nutrition and Diet in Health and Disease, Philadelphia, W. B. Saunders Company, 1943.

# PENTOTHAL SODIUM INTRAVENOUS ANESTHESIA IN PEACE AND WAR

## THE FIRST TEN YEARS OF PENTOTHAL SODIUM INTRAVENOUS ANESTHESIA, JUNE 1934 TO JUNE 1944

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It usually takes several years to establish a new method in any field of medicine. This has been especially true of the introduction of new anesthetic agents and methods and of intravenous anesthesia in particular. The attitudes of different members of the medical profession to the introduction of new methods of anesthesia have often been diametrically opposite; the skepticism of some has been overbalanced by the unbounded enthusiasm of others. These widely divergent attitudes have not always worked to the best interest of the new method or agent. The history of the evolution of intravenous anesthetic agents amply bears this out.[1]

In the case of intravenous anesthesia the skepticism on the part of many surgeons and anesthetists was not entirely without justification. For fifty years anesthetic agents had been introduced for intravenous administration, and only a few of them had produced uniformly safe and desirable anesthesia. Therefore, when pentothal sodium was introduced as another intravenous anesthetic agent it is understandable that many surgeons and anesthetists looked askance at the possibilities of its being of unusual clinical significance.

Pentothal sodium was introduced to clinical practice by Lundy in June 1934, so that this month marks the end of the first decade of its clinical use. While some of the ideas with regard to the use of the agent and method have changed, the original conception of its usefulness has been justified many times over, a fact which has been most gratifying to those of us who have had the opportunity to take a part in its development. Intravenous pentothal sodium anesthesia now stands on its own merits as an established method and has passed well beyond the experimental stages of its development.

However, each one of these ten years has brought about changes in our attitude toward the use of the method, its scope, administration and so forth. There are still many things that one should like to know about the pharmacologic action of pentothal sodium. The most important of these are its site of detoxication and the factors which influence its rapidity of detoxication in various persons. We are not at all sure that it is detoxicated by the liver, like its oxygen analogue pentobarbital sodium.

We are now convinced that pentothal sodium does not appreciably interfere with the function of the normal or damaged liver or kidneys and that it does not untowardly affect the metabolic processes of the body in general, provided it is administered with due regard to the patient's physical state.

In spite of the present day pharmacologic and clinical conceptions that have been generally accepted for pento-

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From the Section on Anesthesiology, Mayo Clinic.

Read before the Section on Anesthesiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1. Adams, R. C.: Intravenous Anesthesia: Evolution of the Method; Application in Clinical and Military Practice, and Consideration of the Use of the Barbiturates and Analeptics, New York, Paul B. Hoeber, Inc., 1944.

thal sodium intravenous anesthesia, the opinions of those who have employed the method extensively are still widely divergent, particularly in relation to the types of surgical cases for which it is suitable. Some feel that it is applicable for almost any type of surgical operation. Others are of the opinion that certain limitations must be recognized unless it is used as an adjunct to some other method of anesthesia—particularly for major surgical cases.

Despite the diversity of opinion on the subject, it is possible to make a few general statements regarding the changes that have been made during the past ten years of its use in civilian surgical practice.

When the use of pentothal sodium was introduced, it was felt that its field should be limited to short and minor operations, requiring little or no muscular relaxation, the duration of which would be approximately fifteen to twenty minutes. Used in this manner as the sole anesthetic agent, its field of usefulness was comparatively narrow. Maximal doses were set between 0.5 and 1 Gm.

As physicians became more familiar with the action of pentothal sodium on patients with varying physical states and for different types of operations, many features of its application were clarified. It was found that the solution of pentothal sodium might be used with safety after it had been made up for periods as long as forty-eight hours. My associates and I have reduced the concentration of the solution from the original 10 per cent to 5 per cent and then to 2.5 per cent. This, we feel, has increased the margin of safety of the method and has reduced the incidence of intravenous or extravenous irritation from the solution to practically nil. Furthermore, it became apparent that comparatively long operations which did not necessitate much muscular relaxation could be performed safely and that many patients would tolerate total doses exceeding 1 Gm. if administered over longer periods.

At the same time, it was recognized that debilitated and toxemic patients had a lowered tolerance to pentothal sodium and took comparatively small doses to produce surgical anesthesia and that the administration to such patients must be carried out slowly and cautiously. The postoperative sleeping time was found to be more or less in direct proportion to the total amount of the drug administered, the amount of preliminary medicaments used and the capacity of the patient to detoxicate the drug. Additional observations revealed the fact that it was not a satisfactory method of anesthesia for most abdominal operations or for operations in regions where the reflexes were particularly hyperactive, such as those of the nose, throat, larynx and the anal region. Some anesthetists are of the opinion that pentothal sodium anesthesia is satisfactory for such operations and provides sufficient relaxation. We continue to feel that its use for major abdominal operations, unsupplemented, does not carry the margin of safety that may be attained by the use of some methods of inhalation or spinal anesthesia. In other words, the advantages that one hopes to derive are often outweighed by the disadvantages, if the operation is long and complicated and requires profound relaxation.

As a result of these findings the value of intravenous anesthesia in combination with other methods began to become apparent. The principle of such combinations was to take advantage of the desirable features of pentothal sodium anesthesia without depressing respiration unduly and producing a prolonged postoperative sleep.

One of the important advances was the administration of oxygen during intravenous anesthesia. This served to decrease respiratory depression and to prevent anoxemia and seemed to favor better muscular relaxation and anesthesia using smaller doses of the drug than otherwise would be necessary. The oxygen may be administered by the ordinary face mask, B. L. B. mask, nasal catheter, nasopharyngeal tube or intratracheal tube.

The next step forward was the administration of 50 per cent nitrous oxide with the oxygen or if necessary as high as 70 per cent nitrous oxide. This serves to reduce further the amount of pentothal sodium required and increases the degree of anesthesia and relaxation. This combination of intravenous anesthesia with inhalation anesthesia has broadened the field of intravenous anesthesia and has increased its safety. The administration of oxygen or of nitrous oxide and oxygen is now routine at the Mayo Clinic during pentothal sodium anesthesia.

Combinations of other methods with intravenous anesthesia have been increasing during the last two or three years. This has been chiefly evidenced in its use with local or regional anesthesia. Among the purposes for which intravenous anesthesia may be combined with local or regional anesthesia are the following: (1) to render local infiltration and block anesthesia painless, such as during a block for bunionectomy; (2) during the course of an operation under local anesthesia if the patient is nervous; (3) to supplement local anesthesia that is wearing off or that is not quite adequate; (4) combined with block of the abdominal wall or intercostal block for abdominal operations in certain cases. These combinations result in adequate abdominal relaxation without one's having to employ large and depressing doses of pentothal sodium.

Similarly, intravenous anesthesia has been useful with spinal anesthesia for nervous patients who prefer to be asleep. Comparatively small doses will control nausea and prevent straining during the course of spinal anesthesia or to supplement spinal anesthesia that is wearing off.

Other combinations may be mentioned, such as the use of intravenous anesthesia as an induction to an inhalation or an ether anesthetic and its combination with topical anesthesia for certain operations about the throat, larynx and upper part of the respiratory tract. For certain operations about the head and neck its combination with nitrous oxide and oxygen administered intratracheally has been particularly useful. With an intratracheal tube inserted, a free airway is established and since none of the agents in this combination are flammable or explosive, a cautery may be used freely and without hazard.

As a result of all these things, the frequency of intravenous anesthesia has been gradually increasing in civilian surgical practice over these first ten years of its use. Owing to the combinations mentioned heretofore, pentothal sodium may now be used safely for many operations in which formerly we would have considered it contraindicated.

We continue to recognize certain contraindications. We do not consider intravenous anesthesia to be as

safe for young children as it is for adults. It should not be used for patients who have degenerative diseases of the myocardium, particularly if dyspnea is present. It is not as safe for operations in which the integrity of the airway cannot be assured as for other operations. One should always remember that intravenous anesthesia is another form of general anesthesia and that many of the complications that are associated with the latter can occur under intravenous anesthesia. We still feel that the method is safest when employed in institutional practice, although its use in the office or home is permissible provided the anesthetist has available equipment for establishing the airway and administering oxygen.

Having observed the progress that intravenous anesthesia has made in civilian practice over this ten year period, we have been extremely interested in what its value would be in army and navy medical practice in time of war. At the beginning of World War II we could only assume that it would play an important role for anesthesia in the armed forces. The simplicity of the equipment, the ease of transportation and its fire proof qualities were obviously in its favor, but we could not be sure how adequate it would be for robust soldiers and sailors or for patients in shock.

Doubts as to the safety of intravenous anesthesia for patients in shock were engendered in the minds of many at the very beginning of the war, when reports began to leak through from Pearl Harbor that its use had proved dangerous and even fatal in a number of such cases. At the same time, experience in civilian practice had convinced us that it could be used safely for many types of operations in such cases provided certain precautions were observed. Subsequent experience on the various battle fronts has corroborated the truth of this statement, the details of which may be summarized as follows:

1. A patient in shock, with or without loss of blood, is much more intolerant to pentothal sodium and requires much smaller doses to produce anesthesia than does the same man without shock. As a result, the effective dose of the drug is materially reduced—sometimes to as little as a fourth or a sixth of the usual dose. If this decreased tolerance as a result of shock is taken into consideration throughout the administration, satisfactory anesthesia may be obtained without producing severe respiratory depression or otherwise endangering the life of the patient.

2. Shock should be controlled, at least partially, before the anesthesia is begun. This maxim applies equally to other methods of anesthesia.

3. Previous administration of morphine should be known as to time of administration and size of dose, in order that a cumulative effect of two depressant drugs may not be superimposed.

4. Airways and oxygen equipment are as essential adjuncts to intravenous anesthesia as they are to inhalation anesthesia. Whenever possible, they should be available when the method is used.

The use of intravenous anesthesia for military surgery not only varies from its present use in civilian practice but also varies in the different types of surgical units within the services. In army or navy base or general hospitals its use parallels that in a civilian hospital. When it must be used in setups close to the combat area such as dressing stations, casualty clearing stations and on the beaches, some of the standard criteria for, and contraindications to, its use must necessarily be subordinated to the urgency of the need for prompt treatment. Perhaps equipment is not readily available or the wounded man may have food in his stomach. In other words, through necessity, certain chances may have to be taken when the method is used under such circumstances.

However, the important consideration here is that the anesthetist has been sufficiently trained in the use of the method and effects of the drug so that he may judge how far he may safely go. The army and navy training programs in various departments of anesthesia throughout the country have been an important factor toward improving anesthesia in the armed forces. We have had letters from all over the world from physicians whom we have trained in our institution and from these reports I should like to draw some conclusions regarding the present status of intravenous anesthesia in military surgery at home and abroad.[2]

Before the United States entered the war we had obtained some information regarding the use of intravenous anesthesia in the surgical services of the British army and navy and for victims of bombing during the battle of Britain. From these reports it was learned that the method had been useful for preliminary débridement of bomb-burn victims and persons who had sustained minor war injuries. When shock was minimal, intravenous anesthesia did not appear to aggravate the shock further and some went so far as to say that its use appeared to protect somewhat against the increase of this state. Early reports from England bore out experimental work showing that pentothal sodium is not contraindicated when patients are undergoing treatment with the sulfonamide compounds. This is contrary to the former supposition.

Reports of the use of pentothal sodium from anesthetists in the armed forces throughout the world vary somewhat according to the type of hospital in which it is used. Most of the reports, however, tell the same general story: that pentothal sodium is of outstanding value. Statements such as "It's been a godsend," "We couldn't do without it" and "If I had to choose a single anesthetic agent, it would be pentothal sodium" are read from the letters of medical officers abroad every day. One officer who had spent eighteen months in the New Hebrides stated that "pentothal sodium has been a life-saver, used as the sole anesthetic in some cases or in combination with other anesthetics." Most of these reports come from physicians who are trained in anesthesia and who recognize its disadvantages and dangers as well as its advantages. These men recognize the fact that there are many types of injuries and operations in which the method may be hazardous and do not use it under such circumstances. While some comparatively recent reports have come through to the effect that the mortality rate under pentothal sodium anesthesia is higher than it should be, the men who are administering it on the battlefronts say that in most instances the fault lies in improper methods of administration and dosage and improper selection of cases.

I should like to sum up some of this information from the personal experiences of anesthetists in the

2. Information quoted from the communications of army and navy medical officers is understood to represent the personal opinion of these officers and does not necessarily reflect the attitude of the army and navy medical services in general.

armed forces at home and abroad. A 2.5 per cent solution is generally employed, but where syringes are scarce 5 per cent solutions or 3.3 per cent solutions are sometimes used. When made up in quantity and kept from exposure to light and air, solutions up to seven and even to ten days old have been employed.

The percentage of cases in which pentothal sodium is used as the sole anesthetic agent or in combination varies. The average appears to be between 25 and 50 per cent. One officer in charge of anesthesia in an outfit immediately behind the front lines stated that, of 500 patients, 95 per cent received pentothal sodium anesthesia. Another, under similar conditions, said that in 78 per cent of operations, excepting those that were intra-abdominal, intravenous anesthesia was used. The distribution of 1,730 anesthetics administered in a base hospital in England over a six months period is shown in the accompanying table.

While the dangers of administering pentothal sodium to a shocked patient who has received a large dose of morphine must be kept in mind, intravenous anesthesia produces better results in robust soldiers or sailors if full doses of barbiturates, morphine and atropine are administered as preliminary medicaments, provided no shock exists. Satisfactory results have been reported by one officer for certain intra-abdominal operations when other methods were not available. In these cases thorough premedication and slow induction with pentothal sodium were used.

*Distribution of Type of Anesthesia*

| Type of Anesthesia | Percentage |
|---|---|
| Intravenous | 41.6 |
| Spinal | 31.4 |
| Regional | 16.9 |
| Inhalation | 5.3 |
| Combined | 4.8 |

Total doses vary widely, but a possible average may be estimated to be between 1,000 and 2,000 mg. In 1 case 5.9 Gm. was used over a period of eight hours. This demonstrates a fact often repeated, that the total dose of pentothal sodium and its administration over several hours need not be a reason to discontinue its use if the patient's condition remains satisfactory throughout. Some very prolonged and extensive operative procedures are possible, provided a good airway can be maintained and if profound muscular relaxation is not essential. This is evidenced by the following report of a case of multiple fractures resulting from an airplane crash:

> While the patient was under pentothal sodium anesthesia the following procedures were performed: open reduction of a compound fracture of the right humerus; suture of the ulnar nerve in the region of this fracture; open reduction of a compound fracture of the right olecranon and application of a cast; reduction of a fracture of the left radius and ulna with cast; reduction of fracture of right tibia and cast. These were done sixteen hours after the injury, shock was treated prior to the operation and 1,000 cc. of blood was administered during the operation.

The types of operations in which intravenous anesthesia has found most favor are too numerous to set down in detail. Most reports state that it is used in almost 100 per cent of orthopedic operations. It is used extensively for the débridement of burns, for skin grafting, in most operations on the skin, in operations on the eyes and for most operations that do not involve the cranial, thoracic or abdominal cavity or the upper part of the respiratory passages.

Army and navy anesthetists seem to be fully aware of the advantages to be gained by intravenous anesthesia in combination with other methods. As in civilian practice, reports of its use with oxygen, with 50 per cent oxygen and 50 per cent nitrous oxide, and with local, block and spinal anesthesia are becoming routine. In those cases in which it is used for intra-abdominal operations it is supplemented by intracostal or abdominal wall block in most instances. It appears to be becoming more frequently used as an induction to general anesthesia, since it decreases the stage of excitation in some of these patients and also lessens the formation of mucus and secretion.

The fireproof qualities of pentothal sodium and its noninflammable supplementary agents are reported to be of decided advantage in the forward areas, on battleships, during bombings or when operations must be performed with emergency lighting equipment which might ignite a flammable anesthetic agent.

While administration of pentothal sodium is by trained medical personnel or under their supervision, it has often been found necessary to utilize the services of nurses or corpsmen, one medical officer supervising the administration of several intravenous anesthetics. Medical officers inform us that many of these corpsmen and nurses have been doing an excellent job, under the proper supervision, and have fulfilled a very useful purpose. The principles of safe administration of pentothal sodium are quickly learned by intelligent nonmedical personnel. The instruction in venipuncture, in this connection, has been of benefit to those who help the medical staff with the administration of plasma and intravenous fluids.

## SUMMARY AND CONCLUSIONS

Pentothal sodium intravenous anesthesia has traversed the first ten years since its introduction. During each of these ten years its use has increased generally throughout the country. Knowing that it is an agent of unusual anesthetic value, many of us have purposely overemphasized certain precautionary measures relative to its method of administration, dosage and selection of cases for its use. This attitude, we believe, is justified in teaching the use of a new anesthetic agent, the administration of which is so simple, the effects of which are so rapid and the results so satisfactory in most cases. The trouble has been that in the past many of the potential dangers incident to its use for certain patients and for certain operations have been overlooked or have been outweighed by its desirable effects. It is under these circumstances that untoward effects have occurred which at times have resulted in justifiable criticism of its safety. Pentothal sodium intravenous anesthesia carries as wide a margin of safety as any established method of anesthesia if it is correctly administered and correctly applied. Those who have had a wide experience with the method have naturally found it a suitable method in more complicated surgical interventions than are generally considered to be within its scope. The most important advance has been the recognition of its potentialities when combined with other methods of anesthesia. These

combinations have increased both the scope and the safety of the method.

The value of the method in military surgery up to the present phase of World War II is more than gratifying. In the final analysis, the application of the method in military surgery does not differ materially from its use in civilian practice. The same principles apply to the two, with the exception that the anesthetist must take into consideration those additional factors inherent in war surgery—shock, loss of blood and often the lack of skilled help and equipment. The anesthetist must weigh these additional factors if he would apply the method to the best advantage. The use of intravenous anesthesia up to the present stage of World War II has even yet been too limited to permit one to draw definite conclusions. Its use in military surgery should provide much additional information for those who will use it in future years.

There is still much to learn about intravenous anesthesia, and no doubt our present attitudes will continue to be modified from time to time. Perhaps new and structurally different agents will be evolved which will completely alter our present opinions of the method. Until such changes do occur, one has in pentothal sodium an intravenous anesthetic agent of undisputed usefulness, which has probably resulted in the most significant advance in anesthesiology throughout the last decade.

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## ABSTRACT OF DISCUSSION

Dr. Alice McNeal, Chicago: In the earlier work in Germany anesthetists determined the dose by the patient's weight. Dr. Lundy has changed it from a haphazard method to something that is as controllable as inhalation anesthesia. We are grateful to Dr. Adams for bringing up the subject of untoward effects. I have seen statements that there are no warnings and therefore no possibility to anticipate difficulties. I have had Dr. Adams's experience with the prolonged use of the anesthetic producing a depressing effect after the patient has been returned to the room. We have been using the drug for most vaginal operations. In the early period we were being called down a couple of times a week to see patients who were depressed. Now I have found how useful is Dr. Lundy's method of a combination of nitrous oxide with the drug, and I have reduced the amount of pentothal sodium toward the end of the operation and have had no further calls for resuscitation. I should like to ask Dr. Adams about the use of the anesthetic for operations on the head and neck. The more I see of it the less enthusiastic I am. I have discovered that no surgeon is to be trusted to watch the airway properly or to do something about it if he does interfere with it. So far I haven't attempted to use the drug for abdominal surgery when complete relaxation is needed.

Dr. Robert A. Hingson, U. S. P. H. S.: I wish to report 10,000 pentothal sodium administrations. They have been administered in a somewhat unorthodox fashion. Because of the shortage of help in our larger marine hospitals we have solicited the aid of nurse anesthetists and medically trained pharmacists' mates. In the latter series of 5,000 cases, administered chiefly by nurses and trained pharmacists' mates, there has been only one anesthetic death, whereas in the first 5,000 cases administered wholly by physicians there were two deaths. Individuals with the background of a nurse anesthetist or pharmacist's mate can be trained to use this technic. We have trained 36 pharmacists' mates who have gone to Coast Guard cutters throughout the North Atlantic, and on occasion these Coast Guard pharmacists' mates have performed magnificently where there was only one physician on a cutter of 150 to 200 men and an anesthetic was needed. We believe that pentothal sodium in their hands is one of the safest forms of anesthesia. We would like to substantiate all of the warnings that Dr. Adams has given. The group at the Mayo Clinic, in introducing this new agent, has always been fair in calling attention to the dangers as well as to the good points. I would urge individuals who report difficulty with this type of anesthetic to go to a clinic where it is being properly used. Only by such dissemination of information can we make final progress. Stimulation of the patient who has been overdosed can be accomplished by administration of 25 mg. of ephedrine in the vein just as promptly as with metrazol.

Dr. S. A. Swenson, Rushville, Neb.: In the hands of an expert there is little danger, although I think one death in 5,000 is rather high. That is about as high as with chloroform. We men out in the country using these methods of experts should use them with due care and with considerable awareness of the danger.

Dr. Hugh A. Cunningham, Milwaukee: I have administered intravenous pentothal sodium 212 times over a period of twenty-six months to a woman aged 27. In the light of the early work on pentothal, this would be strictly contraindicated. This patient has at varying times received all of the sulfonamides. Her lesions were caused by Bacillus necrophorus, an anaerobe that travels by way of the lymphatics, leaving a necrotized area or a large abscess. Pentothal, as it was first introduced by Dr. Rovenstine, should not be administered more than every third to fifth day and should then be carefully watched. This patient frequently has had pentothal as often as twice a day, over an extended period of time. Since the thirty-third administration, periodic liver and kidney function tests have been taken. Over the last forty administrations she has demonstrated from time to time from 4 to 12 per cent dye retention in her liver function tests, but on a short rest she replaces this. She still has the disease; we are still using pentothal, so I would like to ask how often it can be repeated, what changes we should expect, and to how young a patient Dr. Adams has ever given pentothal.

Dr. Arthur C. McCarty, Louisville, Ky.: The Surgeon General of the Army has directed the medical officers to use greater care in the administration of pentothal sodium to avoid untoward results. A directive has been issued saying that pentothal must be limited to minor cases, shall not be used for operations around the head and neck, particularly when there is danger of hemorrhage into the respiratory passages when there is infection in that neighborhood, and in brain operations, prolonged operations, it shall be used rarely or with great caution. This is no news to experienced anesthetists, but obviously difficulties have arisen as the result of the use of pentothal in these circumstances. I am situated in a general hospital which is a neurosurgical center. We have found pentothal useful. One of the discussers mentioned the difficulty of controlling the airway in operations about the head. I have found it useful to pass an intratracheal tube, with the patient under pentothal anesthesia, cocainizing the throat sometimes. At other times I use a local anesthetic in the lubricating solution; sometimes I use no supplementary anesthesia. I have found that the use of an intratracheal tube is of great assistance in controlling respiration in head operations, and it makes these much simpler and cuts down many of the complications that might otherwise arise from respiratory obstruction and from hemorrhage of the respiratory passages.

Dr. Herman Lenowitz, Maywood, Ill.: At a government hospital we have given 5,000 pentothal anesthesias with one death attributable to the drug. The man was in partial congestive failure before the anesthetic was given. We have used pentothal extensively for lesions about the head and neck and for genitourinary work as well as for orthopedic surgery. We do not hesitate to use pentothal in extensive prolonged operative procedures over a long period of time. We have

used as little as a few cubic centimeters of a 2.5 per cent solution and as much as 4.5 Gm. We frequently have occasion to work about the larynx. These are our troublesome problems, because the bleeding has to be controlled in some way, and we have found that by introducing an intratracheal tube and giving oxygen with a catheter the patient does very well. This is particularly true in total glossectomies and in lesions of the nasopharynx. We have discarded the use of the 2.5 per cent sodium pentothal solution. We find a weaker solution is just as effective and that it gives the same type of anesthesia. The control is better, the toxicity is less and the reactions of the patient are very few. We have modified this solution to 1:250, 1:500 or 1:1,000, depending on the purpose for which it is being used. We have used it in conjunction with a spinal anesthetic for an apprehensive patient who wants to be asleep, although we find that spinal anesthesia is the procedure of choice in this particular case. We use it extensively in amputations, in genitourinary work and in thoracic surgery. We do not use it in pneumonectomies or lobectomies, but in thoracoplasties we find it to be a desirable agent.

DR. STUART C. CULLEN, Iowa City: I want to ask Dr. Adams if he concurs in the opinion, expressed by a previous discusser, that the administration of pentothal (which includes a knowledge of the care of the airway, judgment as to its use in certain situations and an ability to remedy untoward reactions promptly and efficiently) is so simple that this agent and technic can be turned over to nonmedically trained persons for unsupervised use.

DR. R. CHARLES ADAMS, Rochester, Minn.: Dr. McNeal's question about the use of pentothal for surgery about the head and neck has been answered by Dr. McCarty. I agree with what he had to say. For extensive operations about the head and neck intratracheal anesthesia carries a wider margin of safety and control, particularly in regard to the airway, than does intravenous anesthesia. When it is necessary to maintain fireproof conditions, an intratracheal tube may usually be inserted under intravenous anesthesia without undue difficulty. This is facilitated by spraying the pharynx and glottic region with a local anesthetic solution. I have no argument with those who wish to use pentothal sodium as a sole anesthetic in abdominal surgery. I have not been able to provide most surgeons with the relaxation they prefer without using excessive doses of pentothal sodium and causing undue respiratory depression in most cases. Under these circumstances I feel that the advantages of intravenous anesthesia are outweighed by the disadvantages. However, by supplementing intravenous anesthesia with an abdominal wall or intercostal block, satisfactory anesthesia can be obtained without undue depression of respiration and without using a large dose of pentothal. In regard to the use of intravenous anesthesia for children, I feel that we have much better and more controllable anesthetics for children under 10 years of age than pentothal sodium. Dr. Cullen's question as to how long it takes to attain judgment in selecting suitable cases for pentothal anesthesia and when you can and when you cannot control the airway is apropos. I believe that its intelligent application requires considerable skill and experience not only with intravenous anesthesia but with other types of anesthesia for the many and varied types of operations. It would be hazardous to entrust the administration of pentothal sodium under these circumstances to nonmedically trained persons, particularly if they were not carefully supervised. To illustrate this point I will cite the case of a boy of 15 years with a little fibroma in his postnasal region for implantation of five or six radon seeds. Pentothal sodium was used, and after the operation had been completed the boy became cyanotic and stopped breathing. I visualized his glottis with a laryngoscope and pulled a large clot of blood out of the trachea, which had resulted in a complete respiratory obstruction and which would have caused his death if I had not had the equipment to remove it promptly.

# CLINICAL OBSERVATIONS IN TYPHUS FEVER

## WITH SPECIAL REFERENCE TO THE CARDIOVASCULAR SYSTEM

MAJOR THEODORE E. WOODWARD

IN COLLABORATION WITH

MAJOR EDWARD F. BLAND

MEDICAL CORPS, ARMY OF THE UNITED STATES

This study was undertaken principally to observe the various physiologic changes occurring in typhus fever with special attention directed to the status of the general circulation. Previous descriptions of the disease frequently refer to cardiac collapse, cardiac failure or cardiac weakness and in areas where typhus is prevalent it is almost a routine procedure to administer cardiac stimulants in the form of digitalis, ouabain or perhaps some other substitute. Likewise, in certain sections cardiac drugs are given because of the extremely weak and toxic appearance of the patient with the thought in mind that these cardiac tonics will improve the circulation. The latter is not in accord with the actual physiologic effect of digitalis, and Luten [1] has shown that the only clinical indication for digitalis and drugs with digitalis-like action is "evidence of cardiac failure" and in certain arrhythmias. In our study there was no clear indication for cardiac stimulants and hence they were not employed. Actually there was evidence to suggest that a possible harmful effect might ensue from their use.

On the other hand little mention has been given to "peripheral circulatory weakness" with minimal stress directed toward its explanation or to this factor playing the major role, exclusive of the heart per se, as the real cause for this very apparent circulatory deficiency. Wolbach, Todd and Palfrey [2] mention 4 fatal cases showing irregular pulse which until death demonstrated no evidence of cardiac insufficiency. The very pathology of typhus suggests an overwhelming generalized involvement. The rickettsias invade the entire circulatory tree, causing swelling of the endothelial cells with actual thrombosis of the smaller and occasionally larger vessels. More commonly the changes are in the smaller vessels, causing multiple minute foci of necrosis (figs. 1 and 2). The typhus lesion has been especially well demonstrated in the skin, liver, kidney, cardiac and voluntary muscle and brain but also in every organ of the body.

Recent progress in handling the various forms of surgical shock [3] indicates an increase of capillary permeability which alters the electrolytic composition of the blood, lowers the osmotic pressure by escape of plasma proteins into the tissues (lowering blood volume) and finally, when circulatory failure is established, creates a vicious cycle with resulting tissue anoxia accentuating the capillary damage. In typhus one does not have to

Major Woodward is attached to the United States of America Typhus Commission. Major Bland is assistant chief of the medical service, 6th General Hospital.

Capt. Daniel S. Ellis, M. C., of the 6th General Hospital, assisted in much of the clinical study. Major Eugene R. Sullivan, M. C., and Capt. Sedwick Meade, M. C., of the 6th General Hospital Laboratory, aided to a considerable extent in the technical investigation.

1. Luten, D.: Clinical Use of Digitalis, Springfield, Ill., and Baltimore, Charles C Thomas, Publisher, 1936.

2. Wolbach, S. B.; Todd, J. L., and Palfrey, F. W.: Etiology and Pathology of Typhus, Cambridge, Mass., Harvard University Press, 1922.

3. Moon, V. H.: Shock: Dynamics, Occurrence and Management, Philadelphia, Lea & Febiger, 1942. Blalock, A.: Principles of Surgical Care, Shock and Other Problems, St. Louis, C. V. Mosby Company, 1940.

presume that there is capillary damage, because this is evident since the endothelial cell is the site of the specific lesion. The present study was outlined to evaluate the state of the circulation, to clarify the status of the "typhus heart" and to investigate the physiologic changes in the blood of severely ill patients.

## PLAN OF STUDY

A ward was established in French Morocco to which patients were admitted as early in the illness as possible, regardless of prognosis. Thirty were studied, representing either severely or critically ill patients. After proper delousing procedures, base line studies were performed, following which the patient was put on a general supportive program. Along with the clinical studies fluid intake and output was observed with a check as to weight loss during the illness. Routine biopsy of the typical skin lesions was performed for future pathologic study. The diagnosis was established by (1) clinical findings, (2) Weil-Felix agglutination, (3) complement fixation with egg antigens,[4] and in certain instances (4) virus isolation in guinea pigs.[5]

Fig. 1.—Skin biopsy of a typhus lesion on the second day of exanthem. It shows swelling of the endothelial cells and a well defined perivascular cellular reaction. (Giemsa.)

4. Castaneda, M. R.: Studies on the Mechanism of Immunity in Typhus Fever, J. Immunol. **31**: 285, 1936. Bengston, I., and Topping, N.: Complement Fixation in Rickettsial Diseases, Am. J. Pub. Health **32**: 48, 1942. Plotz, H.: Complement Fixation in Rickettsial Diseases, Science **97**: 20, 1943.

5. It is universally accepted that a positive proteus (OX 19, OX 2, OX K) agglutination in rising titer is definite evidence of a rickettsial infection. In certain localities where several such diseases occur (North Africa with epidemic and murine typhus along with fièvre boutonneuse) clinical differentiation may be difficult and other laboratory procedures are necessary. The three fevers mentioned may occasionally give proteus agglutination with the OX strains, in which instance complement fixation helps. For example, serum from a case which "fixes" complement using a specific epidemic antigen is more than presumptive evidence of classic European typhus, whereas fixation with a specific murine antigen in high titer indicates murine infection. Serum from a case of fièvre boutonneuse produces negative results with murine and epidemic antigens but "fixes" complement using a Rocky Mountain spotted fever antigen (which coincides with the known antigenic similarities of these strains). An antigen with pure Rickettsia conori (fièvre boutonneuse) would be an additional aid in diagnosis.

## CLINICAL OBSERVATIONS

*Cardiorespiratory.*—Examination of the heart revealed no enlargement, and this was confirmed by x-ray study in 12 instances. Heart sounds were commonly distant, being frequently masked by respiratory sounds, and in this series gallop rhythm and cardiac arrhythmias were consistently absent. In none of the cases was there engorgement of the neck veins or evidence of liver enlargement. Ascites was not observed. Cyanosis of the lips, ears, fingers and toes was a fairly common sign. Peripheral edema was noted in 1 instance on the dorsum of the feet, at which time the patient showed a lowering of plasma proteins (4.98 Gm. per hundred cubic centimeters), a secondary anemia, without concomitant signs of cardiac failure in the veins, liver or lungs.

The pulse at the height of illness was thready, of poor quality and usually in the neighborhood of 110 to 120. Patients responding poorly often had pulse rates of 130 or more and even at times imperceptible by palpation. Several patients with completely adequate circulation showed slightly increased rates even at the time of discharge, whereas in 4 cases a mild bradycardia of 48 to 60 occurred late in the second week of illness.

The pulmonary picture was dominated by varying grades of tracheobronchitis from a true bronchitis to a bronchiolitis. Circulatory congestion of the lung was not observed. Rhonchi and coarse, moist, sibilant and sonorous rales were frequently heard throughout both lungs without percussion impairment. Coughing, often persistent and bothersome, was for the most part nonproductive, since the patient was often too weak to expectorate. Numerous sputum examinations revealed mixed flora with no one organism predominating. When these changes in the lung occurred along with the general circulatory picture of collapse, the patient appeared just as comfortable in the recumbent as in the sitting position, contrary to one suffering from pulmonary congestion of cardiac origin.

*Blood Pressure.*—Daily blood pressures indicated generally a definite drop of both systolic and diastolic readings, in some instances figures as low as 68/40 existing for variable periods. The lowered blood pressure often persisted well into convalescence, a normal figure being noted in many cases six weeks after illness when a follow-up examination was made. Occasionally normal levels were regained soon after defervescence of the acute illness, while a minority sustained adequate tension throughout the illness. Diastolic readings were consistently low, ranging from 40 to 60.

Peripheral circulatory weakness caused by lack of blood vessel tone and low blood volume, rather than cardiac insufficiency per se, most likely accounts for these changes. Avtsin [6] observed this loss of vascular tone because epinephrine hydrochloride when instilled in the conjunctivas of typhus patients did not alter the vascular congestion whereas when instilled in normal conjunctivas prolonged paling occurs.

*Venous Pressures.*—Venous pressure was measured during the first and second week of illness, during early convalescence and in many cases daily and before and after intravenous therapy. Readings were consistently low, ranging from 2 to 12 cm. of water, the average of all cases being 8 cm. of water. In 1 case a preliminary reading of 20 cm. was observed on admission. This man was decidedly spastic and irrational, and it is

6. Avtsin, A. P.: Conjunctival Exanthem in Spotted Typhus, Arch. Path. **36**: 158 (Aug.) 1943.

probable that this apparent initial elevation was the result of technical difficulties (spastic muscles) since all subsequent readings were normal and there was no evidence of congestion of the cervical veins or of the liver. The tests were performed frequently when the respiratory signs were prominent. Furthermore, no increase of venous pressure or of pulmonary congestion was observed after the intravenous administration of 1,000 cc. of fluid—a further indication of the absence of any important element of cardiac weakness in these otherwise seriously ill patients.

*Electrocardiograms.* — Electrocardiograms consisting of the standard limb leads were secured of 24 patients of this series during the most active phase of their disease, usually toward the beginning of the second week. In 4 instances a second tracing was made during convalescence for further study of certain abnormalities previously observed. To supplement this series we had an opportunity during the recent Naples epidemic (1944) to secure records on 14 additional patients also severely ill with typhus. Four of the latter group were in terminal coma at the time records were taken and died two to four hours later.

In general the electrocardiograms exhibited no striking deviations from the normal as regards high grade conduction defects or important T wave changes. However, certain relatively minor abnormalities were recorded with sufficient frequency (in 18 of the 40 patients, or 45 per cent) to warrant a comment: 1. Low voltage of the QRS complexes in all of the standard limb leads of less than 5 mm. deflection was recorded in 7 instances. In 2 additional patients there was slurring of the QRS complexes up to 0.10 second, but in no instance was well defined intraventricular block observed. 2. A delay in the auriculoventricular conduction time of slight degree (0.20 second or more) occurred in 6 patients, but in only 1 of these was the delay as much as 0.23 second. 3. Abnormally low T waves of less than 1 mm. in all leads were noted in 5, and in 2 additional patients there was depression of the ST interval of more than 1 mm. in all leads. 4. Auricular fibrillation with a relatively slow ventricular rate of 70 was recorded in a moribund patient who died two hours later. None of these patients had been taking digitalis or allied drugs.

These results are in accord with the clinical findings, which indicated that no serious disturbance of cardiac function per se appeared to be responsible for the circulatory phenomena previously discussed. A return to normal in the 4 patients in whom subsequent tracings were made during convalescence suggests that these minimal and transient electrocardiographic abnormalities are probably comparable to similar findings in patients severely ill with pneumonia, with typhoid and with uremia.

*Roentgenography.*—We were unable to take routine films on every patient because of technical difficulties, but of the 12 examined cardiac enlargement was not encountered. One patient with a well sustained mitral systolic murmur presented slight prominence in the region of the pulmonary conus. This murmur was heard at the onset and was masked slightly during the illness by the pulmonary picture of tracheobronchitis, but during convalescence and eight weeks after departure from the hospital it was still present with radiation toward the axilla. Electrocardiographic changes in this man of slight left axis deviation and a PR interval of 0.22 second suggested a concurrent rheumatic infection. In most of the films of this as well as of other patients the pulmonary fields were compatable with diffuse bronchitis and in 2 there were areas of localized infiltration of bronchopneumonia, but in none was there evidence of circulatory congestion.

### CLINICAL PATHOLOGIC FINDINGS

*Blood and Hematocrit.*—In severe cases there was a drop in the red blood count of 1 million or more. Usually on admission the count was within normal limits, at which time the patient was severely dehydrated. Once hydration was accomplished, the red cells ranged from 2,500,000 to 3,700,000. The volume of cells ranged from 23 volumes per cent to 42 volumes per cent with the mean figure about 32 volumes per cent. All of the more severe cases presented, during the acute phase of illness, a volume of cells much less than normal. White blood cell counts were more consistently on the lower edge of normal (4,000 to 6,000), but in some cases counts of over 10,000 were found. Patients with pyogenic complications showed the higher counts. Differential smears were not remarkable.

*Serum Protein.*—A drop in the total protein level was not as striking as the corresponding deficiency of the albumin fraction. The overall average for total protein was 5.2 Gm. per hundred cubic centimeters. Fibrinogen determinations were not done, but a drop of albumin and globulin elements was almost consistent and in a large percentage of patients the albumin: globulin ratio was reversed with albumin as low as 0.9. Gm. per hundred cubic centimeters. These findings were pronounced in the second week of disease and persisted well into convalescence. The smaller albumin molecule may well escape into the tissues because of altered capillary permeability, resulting in the edema which is occasionally observed. Several factors account for the reduced total protein figures; (1) lack of adequate protein intake, (2) altered hepatic function and (3) the available protein reserve being quickly expended by the disease process.

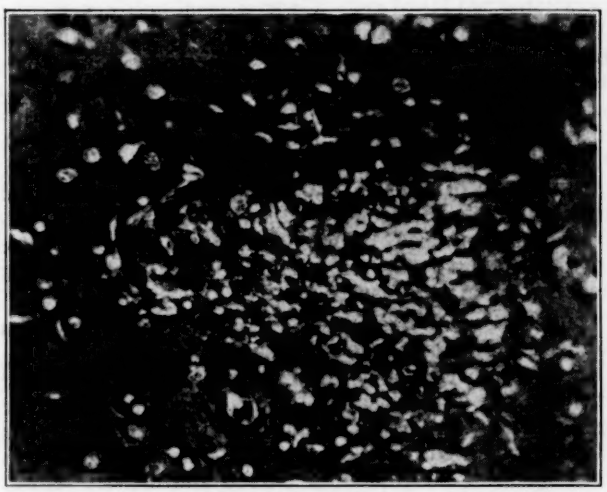

Fig. 2.—Typhus nodule in cerebral tissue of a fatal case. The perivascular elements are pronounced and the vessel is occluded by endothelial swelling and thrombus. (Giemsa.)

*Chlorides.*—This feature is reported by Julliard [7] and was not adequately investigated in this study save for blood levels which were reduced and which could be elevated by oral and parenteral administration of

7. Julliard, J., and Henaff: Troubles du métabolisme hydro-chloruré au cours des typhus épidémique et murin, Rev. serv. de san. mil. **110:** 197, 1939

chloride. Blood levels varied from 70 milliequivalents per liter to 110 milliequivalents per liter. More work is needed to determine the persistence of this abnormality along with tissue analysis to clarify the fate of the chloride. Julliard has found the urine chloride low from early in illness and persisting until the first week of convalescence. This observer reports normal and urine chlorides in the murine typhus case.

*Carbon Dioxide Combining Power.*—In association with the chloride deficit, a state of alkalosis existed in these patients and the semicomatose cases often showed figures of 90 volumes per cent. In those less severely ill this determination was within normal limits, the lowest reading observed being 50 volumes per cent.

*Urinalysis.*—The urine evidenced few abnormal features. The specific gravity was normal, indicating that the kidney was able to concentrate well. In the first and early in the second week variable amounts of albumin appeared, never exceeding 2 plus amounts with the Robert technic. Frequently there was no albumin whatever. The $p_H$ of urine ranged from 7.0 to 8.0. There were few cellular elements noted microscopically, with an occasional white cell and a very occasional red blood cell. Casts were almost never seen. Various forms of crystals appeared, the more common being calcium and amorphous and triple phosphates. Findings for proteose were inconsistent and urobilin was rarely elevated above normal, which indicates the absence of any active red blood cell destruction. Oliguria, commonly seen early in the illness in spite of an intake of 4,000 to 5,000 cc., often persisted until the middle of the second week, when a sudden diuresis frequently appeared. This fact alone is ample evidence of the profound state of dehydration and the need for active corrective measures.

*Nonprotein Nitrogen.*—Severely ill patients, on admission, without previous supportive therapy consistently showed an elevated nonprotein nitrogen, and early in the second week 90 mg. per hundred cubic centimeters was not uncommon. Comatose patients always presented this elevation but, once hydration was accomplished, chloride administered and urinary output sustained, this azotemia could be corrected, and in some instances a nonprotein nitrogen of 90 mg. per hundred cubic centimeters was lowered to 30 mg. per hundred cubic centimeters in three to four days. In less severe cases the nonprotein nitrogen was not remarkable.

In view of these findings it is difficult to explain the azotemia on a renal basis. Extrarenal azotemia is commonly seen in dehydration alone, but in typhus there are additional factors. The circulation is poorly sustained, so that reduced glomerular filtration pressure accompanies reduced arterial tension. The specific pathologic lesion causes widspread protein breakdown in the many minute areas of destruction in the muscle, brain and other tissues. Likewise a certain amount of hepatic dysfunction would tend to load the circulation with an excess amount of nitrogen waste. A small amount of endothelial damage is found in the typhus kidney, but hardly enough to explain the suggested renal embarrassment. Exhaustive renal function tests would be of immense value in evaluating the typhus kidney, to determine whether the azotemia is entirely of renal or extrarenal origin.

*Spinal Fluid.*—Lumbar puncture was done routinely. From the sixth to the tenth day of illness meningismus was commonly so pronounced in certain patients as to suggest a meningeal infection. The absence of Kernig's sign was of great aid in the clinical differentiation. In agitated patients pressures of 240 to 260 mm. of water were seen. Pressures within normal limits likewise existed. In patients subjected to repeat taps the higher readings had returned to normal after five to seven days. Two instances of pleiocytosis were observed, 20 and 80 cells respectively, in each case the predominant cell being mononuclear. The Pandy test rarely showed more than traces of globulin. As previously reported by Blanc,[8] strain isolations were attempted in those patients with the more pronounced central nervous system symptoms. Virus was not successfully isolated from the spinal fluid in spite of attempts as early as the fifth febrile day. In 1 instance isolation was tried simultaneously from blood and spinal fluid, the former being successful and the latter producing only a nonspecific type of temperature curve in the guinea pigs.

*Complications.*—In this series complications were relatively uncommon. Several patients developed severe tracheobronchitis, with an inability to expectorate properly progressing into a patchy bronchopneumonia. One man developed a bilateral otitis media which in no way affected the progress of the disease. A middle aged woman developed a dry pleurisy which ran an acute course of four days and was otherwise not remarkable. Two women developed unilateral parotitis, 1 having been admitted with this infection. Both received adequate supportive measures of intravenous fluids when an adequate intake by mouth was difficult. In spite of the suggested harmful effects of the sulfonamide drugs on typhus[9] small amounts of sulfadiazine were given with the possibility of preventing a bilateral parotid infection, which many times ends fatally. Sufficient urinary output was maintained during this period, and it was felt that little danger from the drug would follow. One of the women (T. B. A.) required surgery for her unilateral parotid abscess, at which time incision and drainage were done, Staphylococcus aureus being subsequently cultured. Both she and the other patient made complete recoveries. Phlebitis was seen in 1 case without further complication.

*Deaths and Mortality Figures.*—Of the 30 patients studied, 2 died. One, a woman aged 73 admitted late in the second week of illness, was hopelessly ill on admission and at the time of her death showed no evidence of cardiac insufficiency and her venous pressure was normal. Autopsy was not permitted. The other patient, a man of 25, died in an overwhelming toxic state with a generalized severe tracheobronchitis, with inability to expectorate mucus. Postmortem examination revealed a normal sized heart (350 Gm.), the lungs showing an early patchy bronchopneumonia with thick, yellowish, tenacious mucus expressed from the bronchi and bronchioles, the latter containing a mixed flora. Throughout the illness this man presented neither venous engorgement, liver enlargement, peripheral edema nor abnormal venous pressures.

In the hospital where this study was performed there were, from the period January to June 1943, 679 cases of typhus with 81 deaths, representing a mortality of 12 per cent. The highest monthly mortality was 15.1 per cent and the lowest 10 per cent. These cases may be considered by our standards to have received inadequate supportive therapy. Our series of 30 cases with 2 deaths represents a mortality of 6.6 per cent. It is

8. Blanc, G.: Recherches sur le typhus exanthématique poursuives au laboratoire de Nich d'Avril à Octobre 1915, Bull. Soc. path. exot. **9**: 5, 1916.

9. Durand, P., and Balozet, L.: Sérothérapie antityphique, Arch. Inst. Pasteur de Tunis **30**: 363, 1941.

difficult to attribute great significance to this lowering, but the assumption that adequate supportive therapy was a factor may be safely made.

### SUPPORTIVE PROGRAM

The general supportive measures employed in these cases and suggested as a rational approach for support of the severe typhus case are as follows:

1. *Nursing.*—Attention to the mouth, care for the prevention of gangrenous skin lesions and the frequent changing of position to facilitate expectoration and to prevent pulmonary complications are most important. The use of sedatives for the agitated case is indicated.

2. *Adequate Fluid Intake.*—At least 4,000 cc. should be given daily, when possible by mouth. In the usual case, in spite of the extreme thirst, this amount may not be taken and the remainder may be given intravenously. This procedure is indicated when there is evidence of a poorly sustained circulation manifested by low arterial tension, a fast thready pulse and cyanosis, along with the evidence given by hematocrit and other studies. Large amounts of subcutaneous fluids are administered with difficulty to the typhus patient and tend to the development of soft tissue edema. Concentrated glucose (50 per cent) has been found useful for patients with oliguria and anuria.

3. *Blood Plasma.*—A small number of patients have been given transfusions of dried blood plasma and the effects have been excellent for supporting the circulation. This is a valuable means for restoring the depleted protein level.

4. *Chlorides.*—The ammonium and sodium salt have been used to improve the hypochloremia. From 2 to 4 Gm. of ammonium chloride was used along with 3 to 5 Gm. of sodium chloride. The ammonium salt is preferable.

5. *Diet.*—In severe cases in which efforts of high caloric drinks by mouth are not feasible, an indwelling stomach tube is of benefit. Nourishing protein and carbohydrate foods may be administered in this fashion to give considerable support to the patient. Vomiting is seen in the early stages of typhus but rarely during the actual course.

6. *Digitalis.*—This drug and other cardiac stimulants were not indicated in a single instance in this series, and we suspect that the indiscriminate use of these for patients as seriously ill as ours may occasionally be actually harmful. In the presence of congestive heart failure or auricular fibrillation with an uncontrolled ventricular rate the cautious use of digitalis combined with diuretic therapy (in the former instance) would seem a desirable adjunct to the general measures outlined.

7. *Sulfonamide Drugs.*—Small amounts were given in cases complicated by purulent infection, during which time satisfactory urinary output was maintained. No ill effects were observed.

8. *Iron.*—This is useful in convalescence for combating the secondary anemia.

### SUMMARY OF FINDINGS

When the various clinical pathologic changes occurring during severe typhus are summarized, a fairly definite physiologic picture is evident. The patient is acutely ill and very toxic, with a significantly low arterial tension and a labile pulse. Usually unless actively supported the patient becomes dehydrated, the red cells decrease and plasma proteins fall with a considerable loss of the albumin fraction indicating a reduced colloidial osmotic pressure. All factors indicate a drop of blood volume with the pattern of hypoproteinemia, hypochloremia and hemodilution without blood destruction. The unstable circulation results in lowered glomerular filtration pressure, and hence oliguria and anuria occur. The kidney, partially damaged by the specific pathologic condition and called on to eliminate an increased amount of nitrogenous waste, is unable to function normally unless adequately supported by fluids. Lowered blood volume means less adequate filling of the heart during diastole and hence lowered cardiac output. Each beat of the heart is less efficient. The use of cardiac stimulants under these conditions is ineffectual, but when the volume of the blood is restored the organ can operate more efficiently. For this reason it appears that cardiac drugs, except perhaps in exceptional instances, are contraindicated in typhus and once the blood volume is restored there is no indication for specific heart therapy unless unmistakable signs of cardiac failure exist, a condition that has not been observed in this series. Wolbach and his associates [2] have demonstrated the typhus lesion in heart muscle, the kidney, and for that matter in every organ of the body with relatively few exceptions. However, the degree of both cardiac and renal pathologic changes is in no way out of proportion to the changes occurring elsewhere, and from our clinical studies it seems unlikely that cardiac failure as such is often a significant factor in the outcome of the fatal case. It is not intended to convey the impression that the treatment of typhus is merely an automatic procedure and once blood chemical and abnormal physiologic processes are corrected that all is well. This is far from true. In typhus we are well aware of the central nervous system involvement with the profound effect of the rickettsial toxin [10] not only on the brain but throughout the entire system. Our studies indicate that in the severe typhus case the chance for recovery is greater by observing and attempting to counteract the various clinical pathologic alterations.

### CONCLUSIONS

From a detailed clinical laboratory study of 30 patients with severe epidemic typhus with special reference to the circulation, it has been shown that:

1. The altered physiologic state, owing probably to widespread endothelial damage in severe cases, consists primarily of an inadequate circulating blood volume, hypoproteinemia (especially the albumin fraction), hypochloremia, hemodilution without blood destruction and an azotemia.

2. The circulatory collapse frequently encountered under these conditions is primarily of peripheral origin.

3. General supportive measures to increase the circulating blood volume are most beneficial.

4. Cardiac drugs (digitalis and allied preparations) are probably of benefit only in exceptional cases with clear evidence of congestive heart failure. This was not encountered in this study.

5. Further investigation is needed to clarify:
   (*a*) The blood electrolytes and tissue analysis to determine the fate of chloride.
   (*b*) Carbon dioxide combining power and the general alkali reserve picture.
   (*c*) Blood volume studies with the use of both whole blood and plasma in support of the reduced volume.

10. Otto, R., and Bickhardt, R.: Ueber das Gift der Fleckfieberrickettsien, Ztschr. f. Hyg. u. Infektionskr. **123**: 447, 1941.

## REPORT OF CASES

CASE 1.—A youth aged 19 was admitted on the fifth day of his illness with a severe headache and an ill defined pink macular rash on the trunk and proximal parts of the extremities. There were coarse rales and rhonchi in the lungs and a normal cardiac contour without venous engorgement, gallop rhythm, palpable liver or peripheral or sacral edema. The spleen was

TABLE 1.—*Clinical Pathologic Studies in Case 1*

| Day | Wbc | Rbc | NPN | Blood Chlorides | Serum Albumin | Serum Globulin | Serum Total | $CO_2$ | Cell Volume, % | Venous Pressure | Complement Fixation | Weil-Felix |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5th | ..... | .... | 29.6 | 106.1 | 2.90 | 2.52 | 5.61 | .... | 32 | 13 | 0 | 0 |
| 6th | 3,600 | 3.21 | 42.8 | 95.8 | .... | .... | .... | .... | .... | .. | ..... | ..... |
| 7th | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .. | ..... | ..... |
| 9th | 4,000 | 3.01 | 42.0 | 93.1 | .... | .... | .... | .... | 24 | 7 | 2/1/6 | 1/640 |
| 10th | 5,100 | 2.60 | .... | ..... | .... | .... | .... | .... | .... | 9 | ..... | ..... |
| 11th | ..... | .... | 28.0 | 87.2 | 1.48 | 3.95 | 5.42 | .... | 27 | .. | ..... | ..... |
| 15th | ..... | .... | 22.0 | ..... | .... | .... | .... | 78.7 | 26.9 | .. | 4/1/192 | 1/320 |
| 21st | 6,000 | 2.89 | .... | ..... | 2.35 | 3.82 | 6.36 | .... | 25.5 | .. | 4/1/768 | ..... |
| 31st | ..... | .... | .... | ..... | .... | .... | .... | .... | .... | .. | 4/1/192 | 1/160 |

easily felt. Until the eighth day of illness he was not severely ill but on that day the headache was more intense and he developed definite and pronounced cervical rigidity, with a negative Kernig's sign. He became completely irrational but would take fluids well. In view of his low blood proteins and a circulation not well sustained (tension ranging from 95/52 to 78/40) he was given transfusions of dried blood

Fig. 3.—Tracings in case 1: *A*, on eighth day of severe typhus, showing low voltage of QRS complexes and a PR interval of 0.19 second. *B*, eighteenth day, during convalescence, showing normal voltage of the QRS complexes and a lessening of the PR interval to 0.15 second.

plasma of 250 cc. daily for four days along with an intake of 4,000 to 5,000 cc. of fluids orally. The urinary output was sustained throughout the illness on this regimen, along with the chloride mentioned previously. The rash was completely faded on the eleventh day. The mental lethargy persisted until the thirteenth day, with the temperature falling by lysis on the

TABLE 2.—*Clinical Pathologic Findings in Case 2*

| Day | Wbc | Rbc | NPN | Blood Chloride | Serum Albumin | Serum Globulin | Serum Total | Cell Volume | Venous Pressure | Complement Fixation | Weil-Felix |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9th | 17,500 | 4.0 | 54.0 | 88.0 | 2.52 | 2.54 | 5.06 | .... | 11.5 | 4/1/24 | 1/640 |
| 12th | 6,100 | 3.5 | 72.0 | 79.2 | .... | .... | .... | .... | 6.5 | 4/1/96 | 1/1280 |
| 13th | ..... | ... | .... | .... | .... | .... | .... | .... | 10.0 | ..... | ..... |
| 14th | ..... | ... | 36.0 | .... | .... | .... | .... | .... | .... | ..... | ..... |
| 18th | ..... | ... | 23.4 | 94.1 | 2.50 | 2.70 | 5.36 | 26.5 | 8.0 | ..... | 1/1280 |
| 23rd | ..... | 3.3 | .... | .... | .... | .... | .... | .... | .... | ..... | ..... |
| 47th | ..... | ... | .... | .... | .... | .... | .... | .... | .... | 4/1/384 | 1/80 |

fourteenth day. During the illness the patient lost 16 pounds (7.3 Kg.). X-ray examination showed the heart and lungs normal. An electrocardiogram on the eighth day of illness showed a low voltage, which was normal on a recheck tracing on the eighteenth day. The PR interval during the acute illness measured 0.19 second but in the subsequent tracing had lessened to 0.15 second (fig. 3 *A* and *B*). The diagnosis was confirmed by a rising titer of the Weil-Felix agglutination along with a positive complement fixation with an epidemic antigen. The clinical pathologic studies are given in table 1.

CASE 2.—A man aged 25, admitted on the sixth day of illness, was irrational and complained of a severe headache. There had been a slight cough from the onset of illness, which was present on admission. Dehydration was pronounced. There was a petechial type rash on the trunk, upper arms and thighs. The tongue was very dry, red and thickly coated. The conjunctivas were much injected, along with considerable suffusion of the eyes. The neck was decidedly stiff, with a negative Kernig's sign. The lungs were clear. The heart was normal without signs of cardiac embarrassment. The blood pressure was 84/60, the pulse rate 120. The liver was not enlarged. On deep palpation the splenic tip was felt. Following several days of an agitated state he developed severe mental lethargy, which persisted until the eleventh day. On this day he developed a bilateral otitis media. From the seventh to the tenth day there were spasmodic bouts of hiccuping, at which time the nonprotein nitrogen was elevated. The patient took orally from 4,000 to 5,000 cc. of fluids, supplemented when necessary by intravenous glucose-saline solution. Concentrated glucose (50 per cent) was given intravenously to help sustain the urinary output. Supplemental chloride was likewise administered orally. The cough, although not too bothersome, was present for ten days, being nonproductive and associated with rhonchi

TABLE 3.—*Clinical Pathologic Findings in Case 3*

| Day | Wbc | Rbc | NPN | Blood Chlorides | Serum Albumin | Serum Globulin | Serum Total | $CO_2$ | Cell Volume, % | Venous Pressure | Complement Fixation | Weil-Felix |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8th | 12,000 | 4.98 | 97.0 | 100.6 | 2.66 | 2.14 | 5.39 | 59.8 | 42 | 9.2 | 0 | 1/80 |
| 11th | ..... | .... | .... | ..... | .... | .... | .... | .... | .... | 9.2 | ..... | .... |
| 12th | 6,100 | 3.83 | 40.0 | 107.4 | .... | .... | 5.29 | .... | 34.8 | ... | 4/1/192 | .... |
| 14th | ..... | .... | .... | ..... | .... | .... | .... | .... | .... | 7.2 | ..... | .... |
| 18th | 6,900 | 3.7 | 28.0 | 105.7 | .... | .... | 6.61 | .... | 38 | ... | 4/1/1536 | 1/20 |
| 30th | ..... | .... | .... | ..... | .... | .... | .... | .... | .. | ... | 4/1/192 | 1/20 |

TABLE 4.—*Clinical Pathologic Findings in Case 4*

| Day | Wbc | Rbc | NPN | Blood Chloride | Serum Albumin | Serum Globulin | Serum Total | Venous Pressure | Complement Fixation | Weil-Felix |
|---|---|---|---|---|---|---|---|---|---|---|
| 13th | 10,000 | 5.02 | 53.2 | 72.2 | 1.29 | 4.11 | 5.31 | 11.2 | 4/1/192 | 1/320 |

Scale of Values: Nonprotein nitrogen, milligrams per hundred cubic centimeters. Blood chloride, milliequivalents per liter. Serum protein, grams per hundred cubic centimeters. Carbon dioxide combining power, volumes per cent. Venous pressure, centimeters of water. Serologic studies represent the serum dilution. Weil-Felix agglutination with Proteus OX 19. Complement fixation with an epidemic egg antigen.

and coarse rales. At no time were there signs of cardiac weakness. Slight edema on the dorsum of both feet was noted on the eleventh day of illness, at which time there was a reversal of the albumin: globulin ratio. The patient was clinically improved and regarded as "safe" on the twelfth day, when he was able to eat and perform voluntarily. The rash was completely faded on the thirteenth day, disappearing terminally on the legs. An electrocardiogram on the eleventh day showed normal voltage. The spinal fluid pressure on the seventh day was 230 mm. of water with 2 lymphocytes. A repeat tap on the seventeenth day revealed a pressure of 40 mm. of water, which was clear with 4 cells.

CASE 3.—A woman aged 25, Arabian, admitted on the eighth to the ninth day of illness in a severe condition, had a unilateral parotitis and a full blown petechial type rash of the usual distribution. She was dehydrated and had a dry filthy mouth and heavy brown coating on the tongue. The right parotid gland was diffusely enlarged, very tender and nonfluctuant. Flexion of the neck was moderately limited, the patient being in an agitated, moderately delirious condition. There were no signs of cardiac enlargement or failure. Occasional rhonchi were heard in the lungs. The blood pressure on admission was 94/72. The spleen was palpable and moderately firm. The patient was given the usual supportive care. The spinal fluid was found to be under normal pressure, with normal dynamics and clear fluid. Venous pressures on admission and throughout her illness were normal. The rash persisted until the fourteenth

day, when only faint pigmented spots remained. The agitation and delirium remained until the thirteenth day, but throughout the illness thirst was constant, so that the patient was able to take adequate oral fluid. She was given small amounts of sulfadiazine, with an initial dose of 3 Gm. and 2 Gm. daily, with the possibility of preventing a bilateral parotid infection, which would probably have resulted fatally. Staphylococcus aureus was subsequently cultured from this infection, since a fluctuant abscess was incised and drained on the seventeenth day. The patient made a complete recovery but after developing a phlebitis, late in convalescence, of the right femoral vein when she was under observation in a surgical ward. The course of the latter was uneventful. An electrocardiogram on the tenth day of illness showed the same low voltage with the PR interval 0.18 second. The urine throughout the illness was normal other than the presence of an abnormal amount of proteose present at the height of the parotid infection. Other findings are given in table 3.

CASE 4.—A white woman aged 73 was admitted on the twelfth to the thirteenth day of illness with pronounced delirium and in an almost completely comatose state. She had a petechial type rash, which was generalized and partially faded on pressure. There was dehydration, with a very dry mouth. Showers of moist rales and coarse rales were heard throughout the lungs, with a partially impaired percussion note posteriorly. The heart was not grossly enlarged, and the liver and spleen were not palpable. Gallop rhythm, venous engorgement, peripheral and sacral edema were absent. There was pronounced cervical rigidity. The respirations were noisy, shallow and rapid. She was obviously regarded as a critical case and was observed as a base line case since she was receiving cardiac and other stimulants by hospital authorities. A severe cough was nonproductive, and the tracheal and bronchial secretion was readily heard. Death came on the third day of hospitalization, and her case is presented because of the interesting physiologic changes. Venous pressure before death was 11.2 cm. of water with no visible evidence of cardiac decompensation. Unfortunately autopsy was not permitted. Other findings are given in table 4.

## Clinical Notes, Suggestions and New Instruments

### TICK BITE PYREXIA

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From May 2 to June 25, 1943, during Tennessee maneuvers, approximately 2,600 patients were admitted to the wards of our evacuation hospital. Hundreds of these patients presented dermatologic evidence of having been bitten by ticks. The present illness of most of these soldiers was in no way related to the tick bites. Many had symptoms which could readily be attributed to secondary complications of the tick bites, such as dermatitis due to local irritation and scratching, cellulitis, lymphangitis and lymphadenitis resulting from secondary infection. Seven patients were proved to have contracted tularemia, 3 showing a typical clinical course of this disease, the other 4 recognizable only by subsequent diagnostic titers of their serum in agglutinating Pasteurella tularensis.

A smaller group of patients was admitted whose essential complaint was fever, with or without chills. Associated symptoms included anorexia, malaise, headache and occasionally abdominal pain and vomiting. Physical examination was essentially negative except for the discovery of one or more engorged ticks attached to the skin. The only positive laboratory finding in 1 of the cases was a moderate increase in the percentage of the polymorphonuclear cells. Removal of the engorged ticks resulted in subsidence of the temperature and complete relief from the associated symptoms in from twelve to thirty-six hours. Further observation and subsequent serologic studies failed to reveal evidence of the development of any of the specific and recognized tick borne diseases. The discharge diagnosis for these patients read "fever, simple, caused by tick bite." For the purpose of this article I have termed this condition "tick bite pyrexia" to differentiate it from the many other pathologic states which have been grouped under the heading "tick fever." The latter name has been used to cover a multitude of conditions. Nuttall [1] expressed his opinion many years ago that this name has lost its significance and should be dropped from our nomenclature.

The following are 5 illustrative summaries of the group of cases which came under observation for this syndrome. (All temperatures were taken orally.)

CASE 1.—A soldier was admitted May 7, 1943 with complaints of fever and pain in the abdomen of two days' duration, slight headache and moderate vomiting. Examination revealed slight tenderness in the right lower part of the abdomen. The skin showed signs of numerous tick bites. Two engorged ticks were found embedded in the right axilla. The admission temperature was 104 F. Blood and urine examinations were normal. The ticks were removed by touching a lighted cigaret to their caudal ends. That evening the temperature had fallen to 100.6 F., the following morning to 99 F. and for the next three days remained at a normal level. Coincident with the fall in temperature there was a subsidence of the complaining symptoms and the patient was discharged to duty on May 10.

CASE 2.—A soldier was admitted during the evening of May 8, 1943 with a history of fever, chills, generalized pains and vomiting of one day's duration. The temperature on admission was 104.6 F. Physical examination disclosed only slight lower right rectus muscle spasm. The total white blood cell count was 7,400 with 88 per cent polymorphonuclears. The following morning inspection disclosed an engorged tick attached to the right buttock. The tick was removed. The temperature remained elevated to 102 F. that day, but on the next morning it reached normal, where it remained for the next three days. There was a complete amelioration of the symptoms coincident with the fall in temperature. The soldier was discharged to duty on May 12.

CASE 3.—A soldier was admitted May 10, 1943 with complaints of fever, headache and generalized pains of one day's duration. Examination was essentially negative except for the presence of an engorged tick attached to the skin in the region of the right flank. The temperature on admission was 102.8 F. The tick was not removed. On the following day the temperature was still elevated to 102 F. The tick was now removed. Twelve hours later the temperature had fallen to 98.8 F. and remained within the normal range for the next three days. The patient was discharged to duty on May 14.

CASE 4.—A soldier was admitted May 11, 1943 with complaints of fever, chills, headache and backache of two days' duration. He stated that he had removed many ticks which had been attached to his skin. Physical examination was negative. The temperature was 101.4 F. The temperature subsided spontaneously and remained normal for thirty-six hours. On the evening of May 13 the temperature was again found to be elevated to 102.6 F. Reinspection of the skin disclosed an engorged tick embedded in the left axilla. The tick was removed. Thirty-six hours later the patient felt well and the temperature subsided to normal, where it remained for the following three days. The patient was discharged to duty on May 17.

CASE 5.—A soldier was admitted May 15, 1943 with complaints of fever, headache and malaise of one day's duration. He stated that he had removed 27 ticks from his body. Examination disclosed 2 engorged ticks embedded in the abdominal wall. An admission temperature was not recorded. The ticks were removed. About eight hours later the temperature was noted to be 97.2 F. and the patient stated that he felt perfectly well. He was discharged to duty on the following day.

#### COMMENT

Ticks are most prevalent during the months of May, June and July. All of our cases of tick bite pyrexia were observed during May.

1. Nuttall, G. H. F.: Parasitology **4**: 88-93 (June) 1911.

The role of the tick in the transmission of specific disease processes has long been definitely established. The tick may serve as a simple carrier and mechanically transfer the disease agent, or it may furnish the site where the parasites grow or multiply during their residence in this vector. Thus the tick has been incriminated in the transmission of tularemia, relapsing fever, Rocky Mountain spotted fever and the allied group of diseases.

It has also long been felt that ticks may serve as direct agents of disease. An ascending paralysis beginning in the legs and occasionally fatal in its outcome, termed "tick paralysis," has been frequently reported in the more recent literature. Strong [2] states that it is believed to be caused by a venom secreted by the salivary glands of the tick during the period of rapid egg development. Abbott [3] feels it is highly improbable that the cause of the paralysis lies with either a virus or a bacterium. It is more plausible that either a toxin or venom may be the underlying factor. The rapid disappearance of paralysis following removal of the ticks seems to confirm this hypothesis.

The rapid subsidence of the temperature and amelioration of symptoms when the engorged, embedded ticks were removed in our cases suggest a similar causative factor in the development of tick bite pyrexia. One would hardly expect such rapid recovery if the fever was infectious in origin. It is more likely that some toxic substance injected by the tick as it takes its blood meal is the factor responsible for the development of the symptoms. That the ticks have been attached for a prolonged period of time is evidenced by their engorgement. Not all ticks carry this fever producing toxin, for only few of the soldiers with attached ticks developed symptoms of this condition. The few ticks which we were able to examine proved to be females of the genus Dermacentor. Mackie [4] states that "apparently Dermacentor ticks, in addition to producing tick paralysis, may in certain individuals cause a picture of chills and fever following tick bite." The exact manner in which the toxin or venom is produced in the tick is unknown, but it can be postulated, as in tick paralysis, that it resides in the female, is associated with the production of eggs and becomes evident only after the tick is partially or fully engorged.

### TREATMENT

A director memorandum June 3, 1943 stated that "there is an indication of the need for preventive control of ticks by all military personnel. In the selection of bivouac sites, tick infested areas should be avoided if possible. Ticks should be removed from the body at least once daily. Careful examination of the body after coming from tick infested areas and on retiring should be routine."

Ticks should be looked for especially on the scalp, neck, axillary and popliteal regions, lower part of the back and the gluteal folds and in the umbilicus. They should be removed intact with a thumb forceps, gasoline or ether or by touching the caudal end of the tick with a hot burned out match or the lighted end of a cigaret. I utilized the latter method. Ticks should never be crushed with bare fingers. The site of the tick bite should be painted with iodine.

### SUMMARY AND CONCLUSIONS

1. Tick bite pyrexia appears to be a definite syndrome resulting from the bites of certain ticks.

2. It is presumably caused by a toxin or venom secreted by the female tick rather than by a bacterium or virus carried by it.

3. Removal of the offending tick is followed by a rapid subsidence of the temperature and associated symptoms.

4. Careful examination of the body and removal of all attached ticks is essential for the control of this syndrome as well as for the control of tick paralysis and other specific tick borne diseases.

2. Strong, R. P.: Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases, ed. 6, Philadelphia, Blakiston Company, 1943, vol. 2, p. 1495.
3. Abbott, K. H.: Tick Paralysis, Proc. Staff Meet., Mayo Clin. **18**: 39-45 (Feb. 10) 1943.
4. Mackie, T. T.: Personal communication to the author, May 15, 1943.

# Council on Pharmacy and Chemistry

## REPORT OF THE COUNCIL

*During the October 1943 Council meeting it was decided that a status report on the prophylaxis of Hemophilus pertussis infections would be of much value for the physician. Accordingly, Dr. Harriet M. Felton and Miss Cecilia Y. Willard have prepared the following statement, which the Council has adopted for publication. The Council will now consider for inclusion in New and Nonofficial Remedies H. pertussis vaccines prepared according to the method of Sauer or of Kendrick and Eldering or of Harrison and Bell.*

AUSTIN E. SMITH, M.D., *Secretary.*

## CURRENT STATUS OF PROPHYLAXIS BY HEMOPHILUS PERTUSSIS VACCINE

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In 1914 the Council on Pharmacy and Chemistry of the American Medical Association admitted pertussis vaccines to New and Nonofficial Remedies on the basis of what appeared at that time to be acceptable clinical evidence. During the next fifteen years these vaccines were used extensively for both prophylaxis and treatment. The reports, however, indicated that the results were not very satisfactory. Therefore in 1928 the Council voted to omit pertussis vaccines from New and Nonofficial Remedies with the close of the longest period for which any one had been accepted, unless new evidence proving efficacy was produced. Reports from different investigators continued to vary and in 1931 the Council [1] recommended that these vaccines be entirely omitted from New and Nonofficial Remedies.

It is interesting to note that in the same year one of the most important advances in the study of the pertussis organism was made. Leslie and Gardner [2] found that Hemophilus pertussis is a uniform species which, when grown on artificial mediums, passes through a series of antigenically different phases. Strains recently isolated from cases of whooping cough were designated as phase I. These strains are virulent for guinea pigs and serologically distinguishable from the variant nonvirulent phases. Since this discovery the majority of vaccines have been prepared from freshly isolated cultures, although stock cultures are still used by some workers who claim that the organisms remain in the virulent phase I if they are grown under suitable conditions.[3] It is quite possible that the varying reports on the use of the earlier vaccines were due in some measure to the lack of uniformity in antigenicity of the strains used in the preparation of the vaccines.

The reports on the use of the earlier vaccines were difficult to evaluate, owing to the fact that no adequate controls were included in the various clinical studies and that the vaccines used were of many types with poorly established, inadequate dosages. However, since 1933 there has been a succession of more careful clinical studies which seem to indicate that vaccines of greater

1. Pertussis Vaccines Omitted from N. N. R., report of the Council on Pharmacy and Chemistry, J. A. M. A. **96**: 613 (Feb. 21) 1931.
2. Leslie, P. H., and Gardner, A. D.: Phases of Haemophilus Pertussis, J. Hyg. **31**: 423-434 (July) 1931.
3. Mishulow, L.: A Comparative Study of Agglutinin Response After Pertussis Vaccination with the Sauer Type and with a Toxin Vaccine and in Untreated Clinical Pertussis, J. Pediat. **9**: 492-504 (Oct.) 1936.

efficiency have been prepared. In order to determine the current status of Hemophilus pertussis vaccines a summary of the most important of these studies will be presented.

The first encouraging reports on immunization were those of Madsen,[4] who presented the results of two epidemics, in 1924 and 1929, in the Faroe Islands. The vaccine used was prepared by the Danish Serotherapeutic Institute, Copenhagen, following the introduction of the cough plate method of diagnosis by Chievitz and Meyer.[5] A forty-eight hour growth of freshly isolated organisms was rubbed into phenolized or formaldehyde treated saline solution to a concentration of 10 billion organisms per cubic centimeter of vaccine. The total dosage was 22 billion bacteria given in three injections at three to four day intervals.

In the first epidemic vaccination was begun after the disease had reached the islands. Here 2,094 children were vaccinated, and there were 627 unvaccinated children of similar age used as controls. The majority of both groups developed the disease, but there were only five deaths in the vaccinated group as compared with eighteen in the control group, or fatality rates of 0.24 and 2.9 per cent, respectively. It was concluded that while the vaccination was of no prophylactic value it greatly reduced the severity and duration of the disease. The records showed that the best results were obtained when the vaccination was completed one week before the onset of the disease.

In the second epidemic vaccination was completed shortly before the outbreak occurred. In this instance prophylaxis was found to be much better. There were 1,832 vaccinated children, of whom 75 per cent contracted whooping cough, but among 446 controls the incidence was 98.2 per cent. The fatality rates were 0.07 per cent and 1.8 per cent, respectively. It was thought that the favorable results were probably due to the fact that the vaccine was made from freshly isolated strains of H. pertussis and to the fact that the course of vaccination was completed shortly before the onset of the epidemic. In both epidemics the total number of bacteria in the immunizing dose of vaccine (22 billion) was larger than that used by others at this time (50 million to 3.5 billion).

In 1933 the first significant reports from the United States were published by Sauer.[6] After obtaining uncertain results with the various commercial vaccines available between 1915 and 1925 he prepared a new type of vaccine, and the results of its use gave definite indication of a more effective product. The preparation of the new vaccine incorporated the principles suggested by Madsen and followed closely the criteria for phase I H. pertussis as described by Leslie and Gardner. From five to seven recently isolated, strongly hemolytic strains were used. The culture medium of Bordet and Gengou [7] was modified to contain human blood instead of horse blood. A forty-eight hour growth of the organisms was scraped from the surface of the medium and suspended in phenolized saline solution in a concentration of 10 billion organisms per cubic centimeter of vaccine. It was found that the total dosage could be increased to a total of 70-80 billion organisms without producing more than a transient local or systemic reaction. The first study included 394 vaccinated children. Of these, 162 were transiently exposed and 29 intimately exposed at some time between four months and four years after vaccination. There were 31 sibling controls for the intimate exposure group. Only 1 vaccinated child developed whooping cough (a mild case), whereas all of the intimate exposure controls developed the disease. In 1937 Sauer [8] reported a series of cases from the Municipal Whooping Cough Prophylactic Clinic at the Health Center, Evanston, Ill. In a three year period 1,122 children were vaccinated. In this group there were 128 exposures, 94 of them intimate, with only 6 cases of whooping cough developing, a communicability rate of 4.7 per cent.

Probably the largest controlled studies on immunization against pertussis have been those of Kendrick and Eldering in Grand Rapids, Mich. Their vaccine [9] was prepared from recently isolated cultures in phase I, as described by Leslie and Gardner. The criteria for accepting any particular culture for a lot of vaccine included (1) typical morphology and growth characteristics, (2) agglutination to high titer by antiserum of phase I organisms, (3) ability to produce phase I agglutinins in the rabbit and (4) development of hemorrhagic necrosis on intradermal injection into rabbits. These criteria for the preparation of pertussis vaccine were included in the recommended procedure of the Committee on Standard Methods of the American Public Health Association.[10] Organisms were grown on Bordet-Gengou medium with 15 to 20 per cent human or sheep blood. The organisms were washed from the medium with saline solution, adjusted to a concentration of 10 billion organisms per cubic centimeter, centrifuged, and resuspended in saline solution containing either merthiolate 1 : 10,000 or 0.5 per cent phenol.

The results of a large study over a period of forty-four months were analyzed by the Committee on Administrative Practice of the American Public Health Association.[11] The study included 4,212 children between the ages of 8 months and 5 years. The injected and control groups were of relatively similar size with an equal distribution of age, sex, family size and geographic districts. There was found to be a striking similarity in the incidence of communicable childhood diseases other than pertussis in the two groups. The pertussis attack rate for the vaccinated group was 2.3 per cent and for the control group 15.1 per cent. The communicability rates for known exposures were 12.8 per cent and 68.5 per cent, respectively. When intimate household exposures alone were considered, the communicability rates were 34.9 per cent and 89.4 per cent. Further analysis [12] revealed a secondary familial attack rate of 36.4 per cent in the vaccinated group and of 92.0 per cent in the control group. Thus it would appear that vaccination resulted in about 60 per cent reduction in the risk of being attacked.

4. Madsen, T.: The Bacteriology, Diagnosis, Prevention and Treatment of Whooping Cough, Boston M. & S. J. **192:** 50-60 (Jan. 8) 1925; Vaccination Against Whooping Cough, J. A. M. A. **101:** 187-188 (July 15) 1933.

5. Chievitz, I., and Meyer, A. H.: Recherches sur la coqueluche, Ann. Inst. Pasteur **30:** 503-524, 1916.

6. Sauer, L. W.: Whooping Cough: A Study in Immunization, J. A. M. A. **100:** 238-241 (Jan. 28) 1933; Immunization with Bacillus Pertussis Vaccine.[32]

7. Bordet, J., and Gengou, O.: Le microbe de la coqueluche, Ann. Inst. Pasteur **20:** 731-741, 1906.

8. Sauer, L. W.: Municipal Control of Whooping Cough, J. A. M. A. **109:** 487-488 (Aug. 14) 1937.

9. Kendrick, P., and Eldering, G.: The Significance of Bacteriological Methods in the Diagnosis and Control of Whooping Cough, Am. J. Pub. Health **25:** 147-155 (Feb.) 1935.

10. Kendrick, P.; Miller, J. J., and Lawson, G. M.; Tentative Methods for the Bacteriological Diagnosis and Control of Whooping Cough, in yearbook of the American Public Health Association, New York, 1935-1936, pp. 200-206.

11. Kendrick, P., and Eldering, G.: A Study in Active Immunization Against Pertussis, Am. J. Hyg. (Sect. B) **29:** 133-153 (May) 1939.

12. Kendrick, P.: Secondary Familial Attack Rates from Pertussis in Vaccinated and Unvaccinated Children, Am. J. Hyg. (Sect. A) **32:** 89-91 (Nov.) 1940.

The most thoroughgoing unfavorable report on pertussis immunization was that of Doull, Shibley, McClelland and others.[13] The study was carried out in Cleveland in 1934 and 1935. Their vaccine was prepared from organisms grown for forty-eight hours on Bordet-Gengou medium containing human blood. The organisms were scraped from the medium, washed once with distilled water and resuspended in saline solution containing 0.5 per cent phenol to a concentration of 10 billion organisms per cubic centimeter. The children, who were between the ages of 6 and 15 months, were carefully selected and observed. There were 479 vaccinated children and 496 nonvaccinated children who were older siblings. The attack rates for the period from three months to 112 weeks after immunization were 15.8 per cent and 18.2 per cent, respectively. This indicates that the incidence of the disease in this study was only slightly less for the vaccinated than for the nonvaccinated group.

In a small study of intimate exposure in an orphanage during an epidemic in 1938 Kramer [14] found that, while vaccination two years previously with Sauer's vaccine did not prevent the disease in the 9 test children, it had produced a partial immunity so that the cases were extremely mild. Twelve control children developed moderately severe cases. In the same group 8 children who had previously had whooping cough also developed mild cases. This would appear to indicate that vaccination had been as effective as a previous attack of the disease in conferring immunity. The figures indicate attack rates of 18 per cent and 24 per cent respectively for the vaccinated and nonvaccinated groups and a communicability rate of 100 per cent for both.

Siegel and Goldberger [15] reported the results of an epidemic in a tuberculosis sanatorium. Sauer's vaccine had been given to 101 children whose average age was 2.8 years. A group of 82 control children whose average age was 2.7 years was selected. Attack rates were 8.9 per cent and 13.4 per cent, while communicability rates were 53 per cent and 58 per cent. The cases in the vaccinated group were somewhat milder and of shorter duration than those in the control group. These workers did not feel, therefore, that the vaccine was of notable value. Sauer,[16] on the other hand, reported good results in an epidemic in an orphanage.

These first two studies were small but were controlled and indicated that, while the vaccine did not prevent the disease where there was prolonged intimate exposure as under the conditions in an institution, it did give protection from severe attacks, the resulting cases being mild and similar to those in children with positive histories of the disease.

A controlled study with the Sauer type vaccine was presented by Singer-Brooks.[17] These studies were started in 1925 by Dr. J. J. Miller in the outpatient department of the University of California. Very severe criteria for exposure were held, and probable or possible exposures were excluded. The vaccinated children were over 5 months of age, and sibling controls were used as far as possible. The follow-up study included educational measures and careful laboratory methods to establish bacteriologic diagnoses on primary cases and contacts. For a group of 330 vaccinated children and 200 sibling controls, communicability rates were reported as 7.8 per cent and 97.7 per cent, respectively. The figures indicate attack rates of 1.5 per cent and 22.0 per cent, respectively.

Silverthorne and Frazer [18] reported 2 cases of whooping cough developing among 747 vaccinated children, of whom 91 were exposed. In a group of 161 control children of whom 27 were exposed, 23 cases developed. These figures would indicate communicability rates of 2.2 and 85.1 per cent for the vaccinated and nonvaccinated groups respectively. Vaccination was by means of a dosage of 120 billion organisms in Sauer type vaccine. The children were followed over a period of five years by public health nurses or private physicians.

Miller and Faber [19] reported results on a small controlled series in the Well Baby Clinic of Stanford University, using Sauer type vaccine. Exact criteria of exposure and diagnosis were maintained. Of 346 vaccinated children 11 contracted the disease, indicating a communicability rate of 26.2 per cent. The communicability rate for a group of 182 control children was 88.9 per cent. Statistical analysis shows the difference between the two communicability rates to be significant.

Coppolino [20] reported favorable results with the Sauer type of vaccine on a small group of children in Philadelphia. Follow-up studies over a period of four and a half years indicated communicability rates for 152 vaccinated and 160 nonvaccinated children to be 7.1 per cent and 84.9 per cent, respectively. Only intimate exposures of two or more hours were recorded as exposure, and in most cases the exposure was for days or weeks.

Other reports, including those of Garvin,[21] Mitchell,[22] Rambar and his associates,[23] Perkins and his associates,[24] Daughtry-Denmark [25] and others present comparable results with the most widely used types of vaccine—those of Sauer and of Kendrick. Although these results continue to vary somewhat, the consensus is that solid immunity is conferred on some children and partial immunity on others, such as may occur following an attack of pertussis.

The two types of vaccine used in most of the preceding studies have several differences in their method of preparation. The Sauer type vaccine is an unwashed suspension of organisms, while the organisms used in the preparation of Kendrick's vaccine have been washed once with saline solution. Sauer [26] stated that the

13. Doull, J. A.; Shibley, G. S., and McClelland, J. E.: Active Immunization Against Whooping Cough: A Preliminary Report, Am. J. Pub. Health **26:** 1097-1105 (Nov.) 1936. Doull, J. A.; Shibley, G. S.; Haskin, G. E.; Bancroft, H.; McClelland, J. E., and Hoelscher, H.: Active Immunization Against Pertussis: Final Report on the Cleveland Immunization of 1934-1935, Am. J. Dis. Child. **58:** 691-698 (Oct.) 1939.

14. Kramer, J. G.: A Study of the Prophylactic Effects of Pertussis Vaccination, J. Pediat. **12:** 160-164 (Feb.) 1938.

15. Siegel, M., and Goldberger, E. W.: Active Immunization of Tuberculous Children Against Whooping Cough with Sauer's Vaccine, J. A. M. A. **109:** 1088-1092 (Oct. 2) 1937.

16. Sauer, L. W.: The Known and Unknown of Bacillus Pertussis Vaccine, Am. J. Pub. Health **25:** 1226-1230 (Nov.) 1935.

17. Singer-Brooks, C.: A Controlled Study of Pertussis Prophylaxis: A Comparison of Phase I H. Pertussis Vaccine with Undenatured Bacterial Antigen, J. Pediat. **14:** 25-38 (Jan.) 1939; Pertussis Prophylaxis.[36]

18. Silverthorne, N., and Frazer, D. T.: Whooping Cough, Canad. M. A. J. **38:** 556-559 (June) 1938.

19. Miller, J. J., and Faber, H. K.: Immunization Against Pertussis, J. A. M. A. **112:** 1145-1148 (March 25) 1939. Miller.[38]

20. Coppolino, J. F.: Pertussis Prophylaxis: A Clinical Study, J. Pediat. **21:** 348-352 (Sept.) 1942.

21. Garvin, J. A.: Efficacy of Sauer's Vaccine: Comparison of Incidence of Preschool Pertussis in a City with High and in One with Low Percentage of Immunization, Ohio State M. J. **36:** 738-739 (July) 1940.

22. Mitchell, F. T.: Experience with Sauer's Vaccine in the Prevention of Whooping Cough, South. M. J. **33:** 440-442 (April) 1940.

23. Rambar, A. C.; Howell, K.; Denenholz, E. J.; Goldman, M., and Stanard, R.: Studies in Immunity to Pertussis: Opsonocytophagic Test, J. A. M. A. **117:** 79-85 (July 12) 1941.

24. Perkins, J. E.; Stebbins, E. L.; Silverman, H. F.; Lembcke, P. A., and Blum, B. M.: Field Study of the Prophylactic Value of Pertussis Vaccine, Am. J. Pub. Health **32:** 63-72 (Jan.) 1942.

25. Daughtry-Denmark, L.: Whooping Cough Vaccine, Am. J. Dis. Child. **63:** 453-466 (March) 1942.

26. Sauer, L. W.: The Preparation of Bacillus Pertussis Vaccine for Immunization, J. A. M. A. **102:** 1471 (May 5) 1934.

supernatant fluid in an unwashed suspension contains an appreciable amount of soluble toxin and that subsequent washing of the original suspension would result in a decrease in the antigenic content of the vaccine. Miller [27] found that saline solution and distilled water washings of H. pertussis organisms contained a specific substance which would combine with the antibody in antipertussis rabbit serum to give flocculation. It was suggested that this might partly explain the differences in the findings of those using washed and unwashed vaccines. However, Kendrick and Eldering [9] found that washing the organisms even three times with saline solution did not decrease the typical skin reaction or the ability to produce agglutinins in the rabbit and therefore washed their organisms once with saline solution before making the final suspension. The vaccine of Doull, Shibley and McClelland,[13] on the other hand, which gave such unfavorable results, was of organisms washed once with distilled water. Miller suggests that perhaps distilled water may denature the surface antigen of H. pertussis, while saline solution simply removes a part of it.

Another difference between the vaccines used at present is in the type of blood used in the medium on which the organisms are grown. Sauer vaccine [28] is prepared from organisms grown on Bordet-Gengou medium that contains human blood, both for the prevention of sensitization of individuals to animal serum and for the maintenance of the organisms in phase I. The growth at forty-eight hours is scraped into saline solution rather than washed from the medium in order to avoid carrying over any extraneous material. Kendrick and Eldering,[9] on the other hand, used either human or sheep blood and found that both maintained the organisms in phase I. They point out that sheep blood is more uniformly constant and less limited in supply than human blood and have used it in the commercial preparation of their vaccine.

A number of workers have felt that the inclusion of toxic substance in H. pertussis vaccine would result in increased potency. In 1930 Mishulow, Mowry and Scott [29] prepared a "toxin-vaccine" by growing the organisms on solid medium with a small amount of horse serum-beef heart broth added to encourage elaboration of toxic material. Each lot of vaccine was tested for the presence of toxic substance by the Shwartzman method. This vaccine was found to elicit agglutinins in rabbits to a greater extent than Sauer's vaccine, which was used for comparison. Later Mishulow [3] reported results from a small clinical study, using material prepared by a modification of the original method. Agglutination studies showed that a greater response was obtained by the use of the toxin-vaccine than by Sauer vaccine. Shorr,[30] Park [31] and Lapin, Cohen and Weichsel [32] reported favorable results of protection in several small studies. It was noted that the local and general reactions to this type of vaccine were greater than with other types. This type of vaccine is distributed by the New York City Department of Health and has been in general use since 1930.

It will be noted that the total dosage of organisms administered in the vaccines in present use ranges from 80 to 120 billion organisms. Madsen [4] had obtained comparatively favorable results by increasing the dosage to 22 billion from between 50 million and 3.5 billion, as used by the majority of workers at that time. Sauer,[33] feeling that an adequate number of organisms is an important factor, then increased the dosage to 70 to 80 billion. Many feel that 80 billion organisms is sufficient, but Daughtry-Denmark [34] and others advocate larger doses to be given to older children and in cases in which complement fixation is not complete after the regular course. Sauer prepared a double strength vaccine of 20 billion organisms per cubic centimeter. This, however, has been largely discontinued, because of the numerous local reactions occurring,[35] and now the "intermediate strength" vaccine of 15 billion organisms per cubic centimeter is that in common use.

Recently a number of investigators have attempted to prolong protection through the use of a stimulating dose of vaccine given at intervals after the initial course of immunization, as in the case of immunizations against diphtheria, tetanus, typhoid and other diseases. Wu and Chu [36] in 1938 found that a single stimulating dose of 15 billion organisms resulted in a large increase in agglutinative titer above that following the initial vaccination. Lapin [37] found close correlation between agglutinative titer, mouse protection and complement fixation in a small study of reinoculated children following exposure to sibling contacts. No cases of the disease developed. Miller,[38] Shaw [39] and others recommended yearly reinoculation. McLean [40] suggested a stimulating dose to be given on exposure and on entrance to school. It is now felt that the duration of immunity may perhaps depend in part on subclinical infection following exposures at a time when resistance is high, serving as a stimulus in increasing resistance. Thus the lower incidence of the disease among older children following exposures might be explained.

During the last few years several studies have been made to determine whether alum precipitation of pertussis vaccine might increase its antigenic efficiency as in the case of diphtheria toxoid. Harrison, Franklin and Bell [41] made a small study with a single dose of such a vaccine and obtained a lower incidence among vaccinated children than among controls, although the difference was not statistically significant. Considering the small dosage used, these preliminary results seemed to justify further study. Bell [42] later conducted a study on the use of two doses of alum precipitated vaccine with a four week interval. The total dosage was 20 billion organisms. This study was very carefully arranged epidemiologically so that the vaccinated and

27. Miller, J. J.: The Loss of Specific Substance in Washing Phase I H. Pertussis Vaccines, Proc. Soc. Exper. Biol. & Med. **37**: 45-49 (Oct.) 1938.
28. Sauer, footnotes 6 and 26.
29. Mishulow, L.; Mowry, I. W., and Scott, E. B.: Pertussis Toxic Filtrates and Toxin-Vaccines, J. Immunol. **19**: 227-235 (Aug.) 1930.
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31. Park, W. H., in Round Table Discussion on Whooping Cough, J. Pediat. **7**: 690-699 (Nov.) 1935; in Report of Proceedings of the Second International Congress on Microbiology, 1937, sect. 8, p. 487.
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33. Sauer, L. W.: Immunization with Bacillus Pertussis Vaccine, J. A. M. A. **101**: 1449-1451 (Nov. 4) 1933.
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35. Sauer, L. W., and Tucker, W. H.: Simultaneous Administration of Diphtheria Toxoid and Pertussis Vaccine in Young Children, Am. J. Pub. Health **32**: 385-388 (April) 1942.
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42. Bell, J. A.: Pertussis Prophylaxis with Two Doses of Alum Precipitated Vaccine, Pub. Health Rep. **56**: 1535-1546 (Aug. 1) 1941.

nonvaccinated groups were identical in all respects without selection, uniformly observed over an adequate period of time and with the definition of clinical pertussis strictly adhered to. Under such well controlled conditions the attack rates were considered significant. For older children the attack rates for vaccinated and nonvaccinated groups were 11.2 per cent and 39.1 per cent, respectively, and for younger children these rates were 9.4 and 29.7 per cent. It was therefore concluded that real protection had been conferred by this vaccine.

Kendrick [43] compared her standard vaccine of 70 billion organisms, given over a period of three weeks, with an alum precipitated vaccine, using a total dosage of 30 billion organisms over a five week period in three injections. There was a one week interval between the first and second and a four week interval between the second and third injections. No significant difference was found between the attack rates of the two vaccinated groups. Daughtry-Denmark,[25] in a comprehensive study of seven different types of vaccine, found alum precipitated vaccine to be as effective as standard vaccine of the same strength when judged by complement fixation reactions.

The combination of pertussis vaccine with diphtheria and/or tetanus toxoid has been suggested by a number of workers. This would be a convenient means of reducing the number of routine immunization injections generally recommended for infants and children. Bordet [44] reported the use of mixed H. pertussis vaccine and diphtheria toxoid given in three injections at three week intervals. Schütze [45] and Mathieson [46] found that, in guinea pigs, alum precipitated pertussis vaccine and diphtheria toxoid inoculated simultaneously were compatible and that the immune response to the toxoid was enhanced, while the response to pertussis vaccine was the same as the response to vaccine alone. Sauer and Tucker [35] obtained development of complement fixing antibodies in response to mixed H. pertussis vaccine and diphtheria toxoid in three doses at three week intervals equal to that obtained with H. pertussis vaccine alone. Daughtry-Denmark [25] obtained like results with three doses at one week intervals. Kendrick [43] has reported satisfactory response in a small study in which pertussis vaccine alone was injected first, followed in one week by a dose of alum precipitated combined diphtheria toxoid and pertussis vaccine. Lapin,[47] Daughtry-Denmark [25] and Miller and Saito [48] have reported encouraging results with the combinations of pertussis vaccine, diphtheria toxoid and tetanus toxoid.

Recent investigations in the field of immunochemistry have shown that H. pertussis has several distinct antigenic components. A "toxic substance" was described by Bordet and Gengou [49] in 1909, but it was not until twenty years later that a toxic factor was shown to be antigenic. Teissier and his associates [50] and Lawson [51] demonstrated the production of neutralizing antibodies in animals by the use of a toxic filtrate of cell extracts. In 1937 Evans and Maitland [52] described a thermolabile toxin and were able to produce neutralizing antibodies in animals. Antitoxin production in human beings, however, was not reported until 1940, when Evans [53] was able to show that careful injection of the toxin over a long period of time could produce a low antitoxic titer. Flosdorf and Kimball [54] later demonstrated the thermolabile toxin of Evans and Maitland and described a second less antigenic thermostable toxin. Strean and Grant [55] prepared what they consider to be pertussis endotoxin by repeatedly freezing and thawing the organisms. The purified preparation was found to contain no agglutinogen. They were able to produce an antitoxin in rabbits by inoculation of this material or a toxoid prepared by formaldehyde treatment.

The role of the pertussis toxin in the clinical disease continues to be unknown; but some workers have felt that, if antitoxic as well as antibacterial immunity could be produced by immunization, the individual might have better protection against whooping cough.

Roberts and Ospeck [56] have prepared a toxic filtrate from broth cultures of strains, not necessarily in phase I, shown to have strong toxic properties. This filtrate is detoxified by solution of formaldehyde and is known commercially as "detoxified pertussis antigen." This preparation has been used in both prophylaxis and treatment. Weichsel and his associates [57] published a report on a clinical study on immunization in a small group of children. Significant antitoxic titers could be produced if adequate dosage was given. The extent of the immunity produced has been measured by laboratory methods, but clinical data on this study are not yet available. Bullowa and Alterman [58] and Joslin and Christensen [59] have described the use of detoxified pertussis antigen as a prophylactic agent, but the studies have not progressed far enough for the results to be properly evaluated. Strean [60] reports that investigation into the value of combined pertussis bacterial vaccine and pertussis toxoid for prophylaxis is under way.

Several other preparations for immunization to pertussis have been developed and given clinical trials in recent years. These include "Undenatured Bacterial Antigen" and "Topagen." The Undenatured Bacterial

43. Kendrick, Pearl L.: Use of Alum Treated Pertussis Vaccine and of Alum Precipitated Combined Pertussis Vaccine and Diphtheria Toxoid, for Immunization, Am. J. Pub. Health **32**: 615-626 (June) 1942.

44. Bordet, J.: A propos du vaccin anticoquelucheux, Bruxelles-méd. **16**: 503-505 (Feb. 2) 1936.

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46. Mathieson, D. R.: A Laboratory Evaluation of a Combined Antigen for Diphtheria and Whooping Cough Prophylaxis, abstracted, J. Bact. **43**: 81 (Feb.) 1942.

47. Lapin, J. H.: Combined Immunization of Infants Against Diphtheria, Tetanus and Whooping Cough, Am. J. Dis. Child. **63**: 225-237 (Feb.) 1942.

48. Miller, J. J., and Saito, T. M.: Concurrent Immunization Against Tetanus, Diphtheria and Pertussis, J. Pediat. **21**: 31-44 (July) 1942.

49. Bordet, J., and Gengou, O.: L'endotoxine coquelucheuse, Ann. Inst. Pasteur **23**: 415-419, 1909.

50. Teissier, P.; Reilly, J.; Rivalier, E., and Cambessédès, H.: Nouvelles recherches sur l'immunité et la sérothérapie anti-endotoxiques: Le sérum anticoquelucheux, J. de physiol. et de path. gén. **27**: 549-564 (Sept.) 1929.

51. Lawson, G. M.: The Epidemiology of Whooping Cough, Am. J. Dis. Child. **46**: 1454 (Dec.) 1933.

52. Evans, D. G., and Maitland, H. B.: The Preparation of the Toxin of H. Pertussis: Its Properties and Relation to Immunity, J. Path. & Bact. **45**: 715-731 (May) 1937.

53. Evans, D. G.: The Production of Pertussis Antitoxin in Rabbits and the Neutralization of Pertussis, Parapertussis and Bronchiseptica Toxins, J. Path. & Bact. **51**: 49-58 (July) 1940.

54. Flosdorf, E. W., and Kimball, A. C.: Separation of the Phase I Agglutinogen of H. Pertussis from Toxic Components, J. Immunol. **39**: 475-493 (Dec.) 1940.

55. Strean, L. P., and Grant, G.: The Preparation and Properties of Haemophilus Pertussis Endotoxin, Canad. M. A. J. **43**: 528-531 (Dec.) 1940.

56. Roberts, M. E., and Ospeck, A. G.: Pertussis Toxin, J. Infect. Dis. **71**: 264-269 (Nov.-Dec.) 1942.

57. Weichsel, M.; Katona, N., and Liu, F.: Pertussis Antitoxin, Am. J. Dis. Child. **64**: 1-10 (July) 1942.

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59. Joslin, C. L., and Christensen, T. A.: Prophylaxis and Treatment of Whooping Cough with a Pertussis Antigen, Am. J. Dis. Child. **60**: 1269-1276 (Dec.) 1940.

60. Strean, L. P.: Immunological Studies on Pertussis Toxin Prepared Free of Agglutinogen, abstr. J. Bact. **43**: 80 (Jan.) 1942.

Antigen, known as "U. B. A.," was prepared by Krueger and his co-workers [61] by washing the organisms three times in Locke's solution, grinding them in a ball mill and retaining the filtrate. Dow,[62] Miller,[63] Lawson [64] and Flosdorf, Kimball and Chambers [65] have given varying reports on the antigenicity of this substance. Singer-Brooks,[66] in a small clinical study, found communicability rates for vaccinated and control groups very similar. It has been suggested that a loss of immune principle may in part be due to the fact that the preparation is carried out at room temperature, at which part of the toxin would be destroyed during the procedure. "Topagen" is a soluble antigen which is administered by the intranasal route. It is prepared by macerating the organisms in saline solution, centrifuging, precipitating the soluble antigen by acetone and redissolving in saline solution. Slesinger,[67] Barksdale [68] and Gold [69] reported good results in the treatment of contacts. However, Dow [62] in animal experiments found Topagen considerably less effective than other vaccines. No large study on prophylaxis with this substance has appeared. It has been suggested for treatment of contact cases.

## COMMENT

The data presented here have been assembled from a number of different investigators who have carried out independent studies under a variety of test conditions. Clinical whooping cough is notoriously unpredictable in the severity of individual attack and epidemic course. However, the majority of the studies have indicated that the incidence of whooping cough can be lowered by the administration of either the Sauer or the Kendrick type of pertussis vaccine in adequate dosage, after six months of age. These new vaccines appear to lower the attack rate in vaccinated individuals and to decrease the severity of the disease.

Although extensive laboratory studies have been carried out in an effort to determine the degree of immunity conferred by pertussis vaccines, the relationship between serologic findings and actual protection of the individual is not clear. There has been in the past no simple index of immunity, such as a reliable skin test. Within the last few years new skin testing technics have been reported,[70] with promising preliminary results. If the results of these methods continue to be satisfactory the control of whooping cough will be greatly simplified.

At present the incidence and severity of the disease as the result of actual exposure under adequately controlled field conditions are the only means of proving the efficiency of whooping cough vaccines. Improved culture methods [71] have given more accurate bacteriologic diagnoses and have aided somewhat in differentiating whooping cough caused by H. pertussis from a similar but milder paroxysmal disease caused by Bacillus parapertussis.[72] Wider use of these methods is advocated for the more adequate control of whooping cough.

The role of pertussis toxin in the disease has not been established. A lack of correlation has been found between the production of antitoxic antibodies and the severity of an attack. The antitoxin is demonstrable for only a short time after the disease and is not found in normal serums. Experimental evidence, on the other hand, has shown agglutinins to phase I organisms over a long period of time after either an attack of the disease or vaccination against it.[73] It would seem, therefore, that whole bacterial vaccines would produce the proper protective antibodies.

A report of the Committee on Therapeutic Procedures for Acute Infectious Diseases and on Biologicals of the American Academy of Pediatrics [74] recommends immunization against pertussis as a routine procedure with the following specifications: 1. Pertussis Vaccine Immunizing (Sauer) 6 cc. of vaccine standardized to 15 billion organisms per cubic centimeter, three injections at three week intervals, or (on the West Coast) 2.5 cc. of vaccine standardized to 40 billion organisms per cubic centimeter, three injections at two to four week intervals. Pertussis Vaccine Immunizing (Kendrick and Eldering) 7 cc. of vaccine standardized to 10 billion organisms per cubic centimeter, four injections. The committee recommends the use of phase I vaccine. 2. Pertussis detoxified antigen, 1.5 to 2.0 cc. subcutaneously for three to five doses every two to three days. 3. Alum precipitated pertussis vaccine (Harrison-Bell) 0.2, 0.3 and 0.5 cc. every four to eight weeks, standardized at 40 billion killed pertussis organisms per cubic centimeter.

Vaccines for the prophylaxis of whooping cough were eliminated from New and Nonofficial Remedies in 1931 because of the fact that convincing evidence of their value was not presented during the years in which they were in extensive use. There was no general agreement on the method of preparation and administration, and clinical reports from physicians varied widely. However, the evidence presented in this report from studies during the period since 1931, with more recent preparations, demonstrate that whole bacterial vaccines prepared from virulent phase I H. pertussis given in proper dosage after 6 months of age do confer significant protection as measured by reduction in the attack rate and severity of pertussis.

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72. Eldering, G., and Kendrick, P.: Bacillus Parapertussis: Species Resembling Both Bacillus Pertussis and Bacillus Bronchisepticus But Identical with Neither, J. Bact. **35:** 561-572 (June) 1938. Miller, J. J.; Saito, T. M., and Silverberg, R. J.: Parapertussis: Clinical and Serological Observations, J. Pediat. **19:** 229-240 (Aug.) 1941.
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SATURDAY, SEPTEMBER 30, 1944

## THE MALE CLIMACTERIC

Some fifteen years have elapsed since the first report on the use of standardized estrogenic substance as treatment of women in the climacteric syndrome. Skepticism about the nature of the menopause and the value of its endocrine therapy has been allayed and the indications for use have been more clearly defined. Those clinicians who believed that the symptoms of the climacteric were wholly psychogenic in etiology and to be treated by sedation or psychotherapy are now convinced of the dependability and efficacy of a variety of estrogenic materials, natural and synthetic. Conviction has been aided by widespread clinical success. Objective proof has included the demonstrations of the effect on the vaginal epithelium and the mammary tissues of the two ovarian hormones both estrogenic and progestational in type. Apparently only the estrogens are involved in the prevention or relief of the autonomic and psychic symptoms which are usually spoken of as the menopause syndrome. A further important observation has been the demonstration of an increase in the urinary excretion of gonadotropic material following castration or the occurrence of the spontaneous menopause. This phenomenon is apparently uniformly observed unless the pituitary is in some way destroyed or removed. The phenomenon has therefore been interpreted as meaning an excessive secretion of pituitary gonadotropic hormone following the elimination or atrophy of the ovaries. There is still room for debate as to whether this is excessive secretion by the pituitary or the excretion by the kidneys of unused anterior lobe gonadotropic hormone.

More recently extensive debate among clinicians has concerned the validity of the concept of the male climacteric syndrome. Castration of male adults is apt to be followed by a group of symptoms essentially identical with those noted in women after removal of the ovaries or spontaneous menopause. Men who do not suffer surgical extirpation of the testicles may never experience such symptoms. Not infrequently, however, complaints of a similar character are made by men in any age from the third decade on. Whether this is to be attributed to testicular atrophy or failure of testicular secretion is the point in question. Many cases of such disorders have been treated with synthetic testosterone propionate or methyltestosterone, the latter being demonstrably active when administered orally. Satisfactory clinical improvement has been reported by several clinicians. Such success might possibly be attributed to the general stimulation of secondary sex characters by these substances or even to the increase in muscle tissue as well as in physical vigor produced thereby. However, the recent work of Heller and his associates from the Wayne University Medical School shows that there is an increase in the anterior pituitary gonadotropic hormone in the urine of men who have been castrated, of men whose testicles have atrophied and of a group of patients who fit the concept of a male climacteric. This is analogous to the situation in the female. Therapy with androgenic materials has given distinct relief to these patients, fitting likewise the probability of the existence of the climacteric. Another group of individuals with somewhat similar complaints had rather indifferent benefits from the use of the androgen; they were shown also to be different in that there was no significant increase of the pituitary gonadotropic hormone in the urine samples investigated.

The facts that are here cited serve to indicate with increasing probability that the male climacteric is just as truly a syndrome based on endocrine disturbances as is the menopause syndrome in women. Unfortunately objective means for making these differentiations are still limited to investigative clinics and hospitals.

## PHYSIOLOGIC ACTION OF IN VIVO ANTICOAGULANTS

Such substances as heparin and dicumarol and to a lesser degree salicylates are known to have definite anticoagulant properties in vivo. The mechanism of this action, as yet not clearly defined, has been partially clarified by the work of numerous investigators; this information has been recently summarized by Quick.[1] In the case of heparin the strongly acid property of the structure assigned to it (mucotin-sulfuric acid-like) by Charles and Todd is considered to be significant. By virtue of this property it is able to form stable salts with many proteins, particularly those with basic reaction. The union of heparin and an as yet unidentified protein co-factor of the albumin fraction of the blood is advanced by Quick to explain the antithrombic activity of heparin. The complex so formed has the power to bind thrombin, thus preventing this substance from assuming its essential role in the coagulation of blood. The participation of this co-factor appears to be necessary, since heparin by itself is not an anticoagu-

1. Quick, A. J.: The Anticoagulants Effective in Vivo with Special Reference to Heparin and Dicumarol, Physiol. Rev. **24**: 297 (July) 1944.

lant. This reaction is reversible when a strongly basic protein like protamine is added to the blood. The antithrombic activity is lost when the heparin breaks its combination with the albumin factor in favor of the more strongly basic protamine, thus releasing the thrombin. Brinkhous and his associates [2] describe another in vivo action of heparin. This involves the blocking of the conversion of prothrombin to thrombin. Here again an unidentified plasma factor appears to be necessary. At present it is not clear whether this represents an interference at the thromboplastic or prothrombic level. Ferguson and Glazko [3] reason that the effect occurs at both points. If this was so the presence of heparin would offer a block to coagulation at several stages.

The effect of heparin on blood platelets is important, since the starting point of a thrombus is a small mass of agglutinated platelets. There does not appear to be a direct action of heparin on the platelets, but clumping of these cells is prevented as a result of the anticoagulant property. Baronofsky and Quick [4] did not find clumping or reduction in the number of platelets in blood to which 0.25 mg. of heparin per cubic centimeter had been added, while Best and his co-workers did not prevent agglutination of platelets in dog blood with the clotting time raised to six hours by heparin. Greater doses were effective in preventing the clumping, however. In general a lack of uniformity in degree of response to heparin has been evident. Possible explanations lie in the variability of the compound itself as obtained from different sources and aberrations in the plasma protein of the subjects studied.

From studies on the hemorrhagic disease in cattle resulting from ingestion of spoiled sweet clover hay has come the isolation by Link and his associates [5] of the active principle, dicumarol. Its chemical structure has been determined and mode of action postulated. The anticoagulant effect is attributed to a depression of synthesis of prothrombin rather than a direct effect on this substance. Quick has demonstrated that prothrombin consists of two components. One of these is known to be diminished in dicumarol poisoning. The mechanism of this reduction is not clear, but it has been suggested that there results an inability of the liver to utilize vitamin K for the production of this prothrombin component, possibly because of a toxic effect on the enzyme system producing prothrombin. The fall in prothrombin after administration of dicumarol takes place rather slowly, reaching its lowest point in about forty-eight to ninety-six hours and returning to normal in a week. Bollman and Preston [6] found a fall of about 15 per cent after three days when a dosage of 10 mg. per kilogram was administered to dogs. According to Quick a critical minimum dose appears necessary, and greatly increased amounts will not hasten the fall in prothrombin. The return of the prothrombin level to normal may be speeded by administration of natural vitamin $K_1$ oxide. Using this material, Davidson and MacDonald [7] reported a reversal of dicumarol effect in 4 out of 5 cases by the use of large doses. There is thought to be either a neutralization of the toxin or a synthesis of prothrombin in the presence of excess vitamin K. Synthetic vitamin K counteracts the dicumarol hypoprothrombinemia in most cases when large doses are used. The transfusion of either fresh or citrated banked blood has not been consistently effective in restoring the prothrombin. Thus there is not available at present any thoroughly dependable agent to combat the hypothrombinemia induced by dicumarol.

The antiprothrombic activity of dicumarol in the liver appears to be its sole effect on this organ. The livers of animals subjected to repeated injections of this material have been found entirely normal at necropsy by several investigators. Liver function tests likewise show no impairment. When dicumarol is used in the presence of existing hepatic damage or when fever exists, a heightened response is reported. There is conflicting evidence of the effect on capillary fragility and sedimentation rate. Wright and Prandone state that increase in capillary fragility was not detected in the patients receiving dicumarol under their observation. However, dicumarol has been noted to cause vascular dilatation and purpura after massive doses. As found with the use of heparin, when the blood coagulation time is greatly delayed by administration of dicumarol, platelet clumping no longer occurs.

More recently Link and his associates and independently Rapoport and his co-workers have made the observation that salicylates administered either orally or intravenously cause hypoprothrombinemia which can be prevented or counteracted by administration of synthetic vitamin K. Several workers who have studied this effect of the salicylates believe that the action is essentially that of dicumarol but less powerful. One of these substances may actually complement the activity of the other. Salicylates show an effect in cirrhosis similar to the increased response found with dicumarol. The potentialities of these actions are great whether or not the agents are used therapeutically under adequate control or exert their effect as an undesirable side reaction. More information on methods of controlling the effects of these anticoagulants and on their potential toxicity is urgently needed.

2. Brinkhous, K. M.; Smith, H. P.; Warner, E. D., and Seegers, W. N.: The Inhibition of Blood Clotting, Am. J. Physiol. **125:** 683 (April) 1939.

3. Ferguson, J. H., and Glazko, A. J.: Heparin and Natural Antiprothrombin in Relation to Activation and "Assay" of Prothrombin, Am. J. Physiol. **134:** 47 (Aug.) 1941.

4. Baronofsky, I. D., and Quick, A. J.: Heparin and the Agglutination of Platelets in Vitro, Proc. Soc. Exper. Biol. & Med. **53:** 173 (June) 1943.

5. Campbell, H. A.; Roberts, W. L.; Smith, W. K., and Link, K. P.: Studies on the Hemorrhagic Sweet Clover Disease, J. Biol. Chem. **136:** 47 (Oct.) 1940.

6. Bollman, J. L., and Preston, F. W.: The Effect of Experimental Administration of Dicoumarin, J. A. M. A. **120:** 1021 (Nov. 28) 1943.

7. Davidson, C. S., and MacDonald, Harriet: A Critical Study of the Action of 3-3′-Methylene-Bis-(4-Hydroxycoumarin) (Dicoumarin), Am. J. M. Sc. **205:** 24 (Jan.) 1943.

## CORONARY HYPERSUSCEPTIBILITY

Klinge [1] and Vaubel [2] of pre-Nazi Germany showed fifteen years ago that in rabbits parenteral administration of large doses of horse serum is often followed by vascular and perivascular alterations in the smaller branches of the coronary arteries, other parts of the vascular system being unaffected. They described the coronary lesions as closely resembling those of "human rheumatism." Interest attaches to these observations, owing to the increasing use of large doses of antiserum in clinical medicine and to the contemplated use of heterologous plasma or plasma fractions in human transfusion. The experiments were therefore repeated by Rich and Gregory [3] of Johns Hopkins University and later studied in greater detail by Fox and Jones [4] of St. Louis University.

The St. Louis investigators made careful microscopic studies of 31 adult albino rabbits previously given one or more intraperitoneal or subcutaneous injections with large doses (10 cc. per kilogram) of horse serum followed by one or more 1 cc. doses given intravenously. The rabbits were killed at arbitrary intervals after the last injection. The investigators found severe coronary lesions in 20 of the 31 injected rabbits, with 7 rabbits showing milder coronary alterations. All noninjected controls were negative.

The vascular changes noted in the injected animals were characterized by intimal hyperplasia and proliferation of adventitial cells, the latter being frequently interspersed with lymphocytes and mononuclear cells or surrounded by them, with an occasional polymorphonuclear neutrophil. Fibroid degeneration was occasionally noted in the intima and media, but without definite necrosis. The coronary lesions closely resembled those often described under such terms as "rheumatoid arteritis" or "rheumatic carditis." [3] The vascular changes were usually limited exclusively to the coronary arterioles, though mild vascular lesions were occasionally found in the liver, lungs, testes, kidneys or mesentery.

Fox did not find any significant relationship between the severity of the coronary lesions and the number of doses, time interval or sequence of large and small doses of horse serum. Some rabbits exhibited severe vascular changes following a single large dose of serum. There was, however, a suggested correlation between the severity of the coronary lesions and the degree of acquired cutaneous sensitivity to horse proteins. All animals with the necrotic type of reaction to routine skin tests exhibited material degenerative changes in the coronary arterioles. Equally manifest changes, however, were occasionally noted in rabbits with nonnecrotic skin sensitivity. Twelve of the 31 rabbits developed Fleisher's [5] "serum sickness reaction" of the ears, following a large parenteral dose of horse serum. This "scarlatinal reaction" was invariably associated with appreciable degenerative changes in the coronary arterioles.

Aside from its bearing on current problems of serum therapy and plasma transfusion, this latest confirmation of the Klinge-Vaubel phenomenon is of basic clinical interest. It is experimental proof that the coronary arterioles are more highly susceptible to mild toxic injury than other parts of the vascular system.

1. Klinge, F.: Beitr. z. path. Anat. u. z. allg. Path. **83**: 185, 1929.
2. Vaubel, E.: Beitr. z. path. Anat. u. z. allg. Path. **89**: 374, 1932.
3. Rich, A. R., and Gregory, J. E.: Bull. Johns Hopkins Hosp. **72**: 65, **73**: 239, 1943.
4. Fox, R. A., and Jones, L. R.: Proc. Soc. Exper. Biol. & Med. **55**: 294 (April) 1944.
5. Fleisher, M. S., and Jones, L.: J. Exper. Med. **54**: 597 (Oct.) 1931.

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## RENAL DAMAGE FROM SULFONAMIDE COMPOUNDS

Shortly after the sulfonamide compounds came into general use, physicians recognized that the kidney may be damaged in the course of therapy with these drugs. Two types of renal complications were observed: (1) those due to mechanical obstruction of the pelves, the ureters and the renal tubules by crystals of the sulfonamide compounds and (2) those due to toxic lesions of the kidney without obstruction. Combination of the two forms has likewise been described. In addition to tubular necrosis, which is the usual expression of damage by toxic substances, instances were observed in which interstitial tissue reaction with necrosis was also present. Murphy and his associates [1] observed 1 such instance in the series reported by them. They feel that this type of reaction is probably an expression of severe idiosyncrasy on the part of the renal tissue to the drug. This inflammatory response was also seen in tissues outside of the kidney represented by giant cells and perivascular granuloma-like cell accumulations suggesting a similarity with periarteritis nodosa and similar lesions. The hepatic damage observed in these cases is probably related to the nephrotoxic complications.

Study of the clinical data of 14 patients with renal insufficiency following use of sulfonamide compounds in relation to postmortem observations on 13 revealed that the quantity of the sulfonamide compound administered and the drug level in the blood appeared to be unimportant in producing the renal damage. As much as 41 grams and as little as 0.6 gram was responsible for fatal renal injury. In a few of their cases deposits of crystals of the drugs in the urinary tract causing some degree of mechanical obstruction were found associated with the nephrotoxic lesion; this was not the

1. Murphy, Francis D.; Kuzma, Joseph F.; Polley, Theodore Z., and Grill, John: Clinicopathologic Studies of Renal Damage Due to Sulfonamide Compounds, Arch. Int. Med. **73**: 433 (June) 1944.

rule, however, as in most of the cases the nephrotoxic lesions were independent of mechanical blocking. Microscopic alterations in tubular epithelium were observed all the way from simple degeneration to tubular necrosis and intense inflammatory reaction outside the nephron. The investigators feel that these tubular lesions represent degrees in the severity of one process rather than different kinds of response. The study failed to correlate the clinical features with the specific site for the renal tubular damage.

Of the numerous toxic complications caused by sulfonamide compounds, that affecting the kidney is most serious. Fortunately these complications are comparatively uncommon. The mechanical type of complication, particularly that outside the kidney, in the pelvis and the ureter, responds best to therapeutic measures. When, however, obstruction occurs within the kidney a cure is not easily accomplished, although always retrograde lavage should be done and the drug discontinued. Precipitation of the sulfonamide compound is the etiologic factor in these obstructions. Precipitation should be prevented as far as possible by the administration of adequate fluids and maintenance of an alkaline urine.

## *Current Comment*

### PLASMA LEVELS OF VITAMIN A AND CAROTENE IN RHEUMATIC SUBJECTS

The explanation for the greater frequency of rheumatic fever in persons in low income groups has been sought in a number of studies. Shank and his colleagues [1] recently determined the levels of vitamin A and carotene in the plasma on four groups of subjects whose intakes of vitamin A had been calculated. The first included 12 normal children in the high income class; their average daily intake was 109 per cent above the recommended amount for age and sex. The other three groups consisted of children with rheumatic infection who no longer showed signs of the active disease but whose diets contained varying quantities of vitamin A. Those in the second group were 24 children who received more than average amounts of vitamin A, their diets averaging 23 per cent above the calculated requirements. In the third group were 46 children who received vitamin A in adequate amounts with an average intake only 5 per cent in excess of calculated needs. The fourth group included 25 children with low vitamin intakes, the average for the group being 44 per cent less than optimum. The subsequent observations revealed a clearcut association between the levels of vitamin A and carotene in the plasma as related to the intake of vitamin A in the diets. Regardless of the concentration of vitamin A or carotene in the plasma prior to the onset of active exacerbations of the disease, there is a fall in the level of vitamin A in the plasma with the development of acute rheumatic fever; the carotene in the plasma was not significantly altered quantitatively during rheumatic attacks. Furthermore, it was found that the degree of decrease of vitamin A in plasma varies directly with the intensity of the rheumatic attack. In the presence of severe attacks, concentrations in the plasma varied between 0 and 70 international units of vitamin A per hundred cubic centimeters of plasma. Delayed or decreased absorption of vitamin A was thus shown in patients with rheumatic fever. Nevertheless, uncertainty prevails as to whether vitamin A is destroyed in some abnormal manner or whether it is utilized normally but with increased speed of metabolism and that this accounts for its lowering in the presence of the active disease. Whether or not the vitamin A disturbance is a causative factor in the rheumatic process or merely a result of the process remains for further investigation.

1. Shank, Robert E., and others: The Level of Vitamin A and Carotene in the Plasma of Rheumatic Subjects, J. Clin. Investigation **23**: 289 (May) 1944.

### DISHWASHING IN RESTAURANTS

The sanitary procedures of restaurant operation, including the adequacy of the methods of sanitizing eating and drinking utensils, are matters of general concern. Recently mobile laboratory units of the United States Public Health Service have cooperated with state and local health departments in making swab tests of restaurant utensils in numerous communities in different sections of the country. Unpublished reports of this work, according to Andrews,[1] reveal that improvement is needed in dishwashing methods in most, if not all, of the communities visited. This disappointing condition exists in spite of the availability of adequate information on choice of detergents and machine and hand washing technics. The fault is primarily in personnel. Frequently a person doing the dishwashing has not been properly instructed in technic. Good equipment is worthless if improperly operated. Since the outbreak of the war, the problem of maintaining good sanitation in restaurants has obviously become intensified by shortages of manpower, materials, increased customer loads and reduction of health department inspection facilities. In the face of evidence that the amount of disease spread in restaurants is increasing, health departments should intensify their efforts at control. Experience has shown that health authorities achieve the most satisfactory results by education rather than by policing. Properly organized training courses for employees of restaurants will probably prove more effective than any other one measure. As pointed out by Andrews, restaurant sanitation is an important public health activity, and wartime conditions with the probability of long continued overloading of restaurants in many areas gives this problem a special urgency.

1. Andrews, John: Methods of Sanitizing Eating and Drinking Utensils, Pub. Health Rep. **59**: 1103 (Aug. 25) 1944.

# MEDICINE AND THE WAR

## ARMY

### NEW VACCINE TO PROTECT ARMY AGAINST SPREAD OF INFLUENZA

The War Department announced recently plans for the procurement and possible use of a vaccine to combat the spread of influenza in the Army, should the disease occur in epidemic form. The plans are based on evidence presented by the Commission on Influenza under the Army Epidemiological Board. The vaccine will not be administered routinely but will be given only on definite indication of the threat of influenza and only to personnel under risk of exposure to the disease. A statement of policy and a summary of the evidence for the prophylactic value of influenza vaccine was recently issued to all medical officers in a technical bulletin from the Office of the Surgeon General.

One of the main projects of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, ever since its establishment in 1941, has been the development of protection against influenza. This board, now called the Army Epidemiological Board, is under the presidency of Dr. Francis G. Blake, Dean of Yale University School of Medicine, New Haven, Conn. Under this board the Commission on Influenza, of which Dr. Thomas Francis Jr., professor of epidemiology at the University of Michigan School of Public Health, is director, was asked in 1943 to carry out a controlled clinical trial of the prophylactic efficacy against epidemic influenza of a concentrated vaccine containing the killed influenza viruses types A and B. In cooperation with a number of civilian and military agencies an extensive investigation was carried out. On the whole, the results showed that there was a reduction of about 75 per cent in the incidence of influenza among the vaccinated as compared with the unvaccinated controls and that loss of manpower hours was reduced because the illness in vaccinated persons was milder and shorter. The vaccine which was used was developed by Dr. Thomas Francis Jr., Dr. Jonas E. Salk and their associates.

### BRIG. GEN. CHARLES R. GLENN APPOINTED DEPUTY AIR SURGEON

Brig. Gen. Charles R. Glenn, surgeon at the AAF Training Command, Fort Worth 2, Texas, has been appointed Deputy Air Surgeon. Col. Neely C. Mashburn, General Glenn's executive since July 1943, will succeed him. In his new assignment General Glenn will serve as assistant to Major Gen. David N. W. Grant, Surgeon on the Air Staff at AAF headquarters in Washington, D. C. Both General Glenn and Colonel Mashburn are Regular Army officers.

General Glenn, who graduated from Jefferson Medical College of Philadelphia in 1914, became a first lieutenant in the reserve on May 13, 1917. He was commissioned in the Regular Army before the end of the first world war. It was largely under his direction that training command surgeons, together with a group of highly specialized psychologists, developed the now famous system for the selection and classification of air crew trainees—pilots, bombardiers, navigators and gunners—a system designed to find the right man for the right job. In June and July of this year General Glenn made a sixty day world encircling inspection and observation flight during which he covered 40,000 miles, visiting U. S. combat air forces in every active theater except England and Alaska.

Colonel Mashburn graduated from Vanderbilt University School of Medicine, Nashville, Tenn., in 1914. He went overseas and served with the medical corps in Paris in February 1918 at the 18th Hospital of Evacuation and Operations south of Dunkirk, with the 32d, 29th and 88th divisions of the Alsace front in the x-ray section of a field hospital, with the Johns Hopkins unit in a general hospital center near General Pershing's headquarters and finally at La Rochelle, just above Bordeaux. After his return to the United States in July 1919 he was ordered to the station hospital for the 1st Division at Louisville, Ky. From May 1920 to 1934 Colonel Mashburn experienced a variety of duty tours. He served as an instructor in the School of Aviation Medicine, Randolph Field, Texas, from 1934 to 1940. In 1941 he was appointed command surgeon for the Southeast Training Center at Maxwell Field. He became post surgeon at Ellington Field, Texas, in the Central Flying Training Command, known then as the Gulf Coast Training Center.

### NEW PENICILLIN STUDY INSTITUTED AT FORT BRAGG

Dr. Charles Rammelkamp, member of the commission on Acute Respiratory Diseases, Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, and Capt. William Leifer, M. C., Regional Hospital, Fort Bragg, North Carolina, recently spent several days in the Office of the Surgeon General conferring on the new method of administering penicillin developed by Capt. Monroe J. Romansky, M. C., at the Army Medical Center. The new technic prolongs the action of penicillin by suspending it in a mixture of 4 per cent beeswax and peanut oil. Dr. Rammelkamp will act in a consulting capacity with Dr. Leifer, who is instituting a study of the method at Fort Bragg Regional Hospital. It is believed that the new method will have important effects on the use of this agent.

### COL. ROBERT H. KENNEDY APPOINTED TO MAYO GENERAL HOSPITAL

Col. Robert H. Kennedy, former director of surgery at Beekman Hospital, New York, and attending surgeon at the New York Post-Graduate Hospital, has recently been appointed chief of surgical service at Mayo General Hospital, Galesburg, Ill. Dr. Kennedy, a veteran of World War I, succeeds Col. Emery Neff, former surgical chief, who left for treatment at Percy Jones General Hospital. Dr. Kennedy was called to active duty in World War II with the rank of lieutenant colonel in June 1942. He was promoted to colonel on April 3, 1943. Dr. Kennedy graduated from Columbia University College of Physicians and Surgeons in 1912.

### DR. H. JACKSON DAVIS WITH ARMY CIVIL PUBLIC HEALTH DIVISION

Dr. H. Jackson Davis, chief medical officer of the State Department of Social Welfare, Albany, N. Y., has been granted military leave from the department to accept a commission as major in the newly established Civil Public Health Division, U. S. Army Medical Corps. The Civil Public Health Division will develop public health policies and practices in liberated and occupied countries in all war theaters, establish supervisory and liaison relations with local public health officials and provide certain essential medical supplies in those areas. Dr. Davis is a veteran of World War I. He graduated from Yale University School of Medicine, New Haven, Conn., in 1926.

### MAJOR ALFRED GOLDEN GIVEN NEW ASSIGNMENT

Major Alfred Golden, formerly of Madison, Wis., who has been on duty for the past four years at the Army Medical Museum, has been transferred to the Division of Health and Sanitation, Office of the Coordinator of Inter-American Affairs. Dr. Golden will be assigned to duty in Latin America to study the pathology of certain tropical diseases.

## TROOPS EXPOSED TO FILARIASIS PARASITE BEING OBSERVED AT WAKEMAN GENERAL HOSPITAL

More than five hundred servicemen who have been exposed to filariasis are being observed at the Wakeman General Hospital, Camp Atterbury, Indiana. Although the presence of the disease has been established in only a small percentage, the condition of none of the men is serious. The men were returned to the United States in accordance with War Department policy of evacuating military personnel from endemic regions after exposure to the disease in order to avoid complications that might develop following prolonged exposure. All the men just returned were evacuated after a comparatively short exposure to filariasis, and there is little likelihood that the more serious permanent consequences, including elephantiasis, will develop.

Transmission of the disease is possible only when immature forms of the parasite are circulating in the blood of an infected person. Such larval forms must be taken up by a mosquito in order to complete their development. None of these immature forms have been found in the blood of any of the returned soldiers. Consequently there is no risk that they will spread the disease in this country. Most of the men will receive furloughs, after which they will return to the convalescent hospital. It is expected that the majority will return to duty within a short time.

## THIRTY-TWO MEDICAL OFFICERS RECEIVE REGULAR ARMY APPOINTMENT

Thirty-two medical officers who successfully completed examinations for regular army appointment held in January were nominated in the Senate recently and confirmed by that body as first lieutenants in the Regular Army Medical Corps. The officers who hold grades higher than those to which they are appointed in the Regular Army will retain such higher temporary grades. Those nominated were:

Capt. A. L. Baker Jr., Dover, N. J.
Major B. H. Bennett, Washington, D. C.
Capt. A. S. Blauw, Boulder, Colo.
Major H. Boyd Jr., Kingston, N. Y.
Capt. D. H. Cahoon, Roswell, N. M.
Capt. J. S. Clapp, Erie, Pa.
Capt. W. D. Dugan, Eugene, Ore.
Capt. H. V. Ellingson, Rochester, N. Y.
Capt. R. C. Feamster, New Orleans.
Capt. C. C. Flood, Ramsey, N. J.
Major E. J. Genetti, Bessemer, Mich.
1st Lieut. F. E. Harrigan Jr. (M. Res.), West Hartford, Conn.
Capt. K. D. Heuser, Denver.
Capt. R. R. Jones, Dallas, Texas.
Major V. C. Kelly, Baltimore.
Capt. K. A. Koerner, St. Louis.
Capt. Robert Landesman, New York.
Capt. R. E. Lau, York, Pa.
1st Lieut. J. P. McEvoy (M. Res.), St. Paul.
Capt. J. M. McIver, Boston.
1st Lieut. G. B. Milburn, San Antonio, Texas.
Capt. T. M. Mulford, San Diego, Calif.
Capt. J. R. Paul, Lincoln, Neb.
Lieut. Col. G. S. Richardson, Roswell, N. M.
Major H. L. Riva, Charleroi, Pa.
Capt. J. N. Schaeffer, Miamisburg, Ohio.
Capt. Edward Shaw, West Hartford, Conn.
Major F. R. Sloan, Marquette, Ia.
1st Lieut. N. R. Spencer (M. Res.), Bethesda, Md.
1st Lieut. R. W. Thometz (M. Res.), Oak Park, Ill.
Capt. C. F. Vorder Bruegge, Memphis, Tenn.
Lieut. Col. J. E. Walther, Rushville, Ind.

## RECONDITIONING NEWS LETTER

A new publication, *Reconditioning News Letter,* is now being distributed monthly by the Office of the Surgeon General to all ASF hospital commanders and service command surgeons. Its aim is to familiarize hospital personnel with new ideas, practices and procedures connected with the reconditioning program. Sources of the items published are reports made by inspecting officers from the Surgeon General's Office, chiefs of the reconditioning branches in service commands, medical officers and others familiar with the program.

## INCIDENCE OF POLIOMYELITIS AMONG U. S. TROOPS

In the two week period ended September 2, 20 cases of poliomyelitis were reported by army installations in the United States. This represents a slightly higher incidence than for the corresponding period last year. The total incidence since the first of the year is somewhat lower than in the corresponding eight month period of 1943. While most of the cases have occurred in the states which have a high civilian incidence of the disease, they have been widely scattered.

## ADVANCE IN AURAL REHABILITATION PROGRAM

Borden General Hospital, Chickasha, Okla., has installed electroacoustical apparatus enabling it to fit the individual patient with the best combination of manufactured hearing aids. Such equipment is rarely found in civilian institutions and represents a progressive step in the aural rehabilitation program. Hoff General Hospital, Santa Barbara, Calif., and Deshon General Hospital, Butler, Pa., will be similarly equipped in the near future.

## ARMY AWARDS AND COMMENDATIONS

### Captain Cecil D. Conrad

The Soldier's Medal was recently awarded to Capt. Cecil D. Conrad, formerly of Highland Park, Mich. The citation accompanying the award reads "On March 22, 1944, when a fully loaded bomber crashed on takeoff at Decimemmanu, Sardinia, he observed that one engine was cutting out as the airplane sped along the runway and realized that a crash was imminent. He started his vehicle and arrived at the scene of the accident immediately after the plane struck. The terrific impact, which shattered and set fire to the B-26, killed one member of the crew and seriously injured others. With complete disregard for his own safety, and despite exploding ammunition and the great danger of fire setting off the bombs, he made his way into the wreckage and, with the aid of a comrade, removed the stricken crew members from the danger area. His heroism and selfless devotion to duty in risking his life to save others reflect highest credit on himself and the armed forces of the United States." Dr. Conrad graduated from Wayne University College of Medicine, Detroit, in 1941 and entered the service Oct. 24, 1941.

### Major John Connell

Major John Connell, formerly of Des Moines, Iowa, has been awarded the Silver Star Medal "for gallantry in action in October 1943 in Italy. During an attack by an infantry regiment over a river Captain Connell followed the infantry across the river and by his own ingenuity organized routes of evacuation of battle casualties. All through the attack, which lasted two days, Captain Connell supervised the proper function of new routes and constantly reconnoitered to improve, shorten or hasten the evacuation even though the routes were under enemy fire. He made several trips across the river, which was still under enemy observation and heavy artillery and mortar fire. Undoubtedly the ingenuity and perseverance of Captain Connell, and the calm and courageous manner in which he performed his duties, saved the lives of many battle casualties and was instrumental in their being evacuated more quickly from the front lines. His coolness under fire and devotion to duty were exemplary and a credit to the armed forces of the United States." Dr. Connell graduated from Washington University School of Medicine, St. Louis, in 1937 and entered the service Feb. 10, 1941.

### Captain Harlan Alfred Alexander

Capt. Harlan A. Alexander, formerly of Minneapolis, was recently presented with the Bronze Star Medal "for heroic achievement" in military operations against the Japanese on Attu Island in May 1943. The citation read "Capt. Harlan A. Alexander, Medical Corps, United States Army. For heroic achievement in connection with military operations against the enemy on May 16, 1943 during the Attu operation. After a furious battle an infantry company was forced to withdraw under withering enemy fire, leaving 5 casualties which had not yet been evacuated. After the withdrawal Captain Alexander, with complete disregard for his own safety, three times led a small group of aid men up a mountain and successfully evacuated 5 wounded men, although the entire route was over enenty terrain. His courageous action was an inspiration to the men of the battalion and resulted in saving the lives of 3 of the 5 wounded soldiers. His courage, coolness under fire and disregard for his personal safety reflect great credit on himself and the military service." Dr. Alexander graduated from the University of Minnesota Medical School, Minneapolis, in 1930 and entered the service Sept. 8, 1942.

# NAVY

## FIRST AID STATION AT GUAM

Seven machine guns set up in the windows of a besieged American first aid station held a bitterly contested sector of the Marine front lines for several hours recently at Guam. The station was commanded by Lieut. George W. Eldering, formerly of Los Angeles, who in desperation had asked for weapons support when the Japs ignored the aid station's immunity under international law and had launched an attack toward it. The station was located in a shell battered Jap storehouse well in advance of the Marine lines and had been established by Dr. Eldering and his men while some of the fighting of this campaign raged about them. "It was the best place we could find at the time," Dr. Eldering stated. "The front and side walls of the storehouse were still standing and offered some protection, though the roof and back wall were gone. After I had ordered the guns set up, I could find only five fit Marines to man them, so 2 of the patients took over the others. I ordered all patients evacuated immediately after first aid because I wasn't sure we could hold out for any length of time in that spot. Finally the orders came for us to fall back to a position about 500 yards behind the front lines. It was then we learned that our machine guns had held that part of the front alone."

## NAVY AWARDS AND COMMENDATIONS

### Lieutenant Commander Tom T. Flaherty

The Air Medal was recently awarded to Lieut. Comdr. Tom T. Flaherty, formerly of Long Beach, Calif. The citation accompanying the award read "For meritorious achievement in aerial flight as crew member of an R4D Transport Plane attached to the South Pacific Air Transport Command from July 15 to 25, 1943. When his craft was unable to land on the densely overgrown jungle terrain while transporting urgently needed supplies to our forces on New Georgia Island, Lieutenant Commander Flaherty skilfully performed his duties and rendered invaluable assistance to his pilot in accurately dropping the cargo as the unarmed plane flew in at terrific speed and at tree top level to avoid intense enemy antiaircraft fire and aerial opposition, making several hazardous runs on the targets to complete the mission and frequently returning to base without the protection of covering planes. Lieutenant Commander Flaherty's cool courage and unwavering devotion to duty under extremely difficult conditions contributed materially to the success of these vital missions and were in keeping with the highest traditions of the United States Naval Service." Dr. Flaherty graduated from the University of Southern California School of Medicine, Los Angeles, in 1939 and entered the service July 14 of that year.

### Lieutenant Commander Ben H. Keyserling

The Silver Star Medal was recently awarded to Lieut. Comdr. Ben H. Keyserling, formerly of Columbia, S. C. The citation accompanying the award read:

"While his unit was engaged with the enemy, Commander Keyserling displayed a high degree of courage, initiative and professional skill under the most hazardous of conditions.

"Dr. Keyserling, after all available stretchers had been evacuated to the rear with wounded, advanced to within a few yards of the front line assault companies, coolly and expertly treated wounded as they fell and evacuated them to the rear under heavy machine gun and rifle fire, for a full half hour.

"The fact that many were saved who would otherwise have perished may be attributed to Dr. Keyserling's courage . . . in the rendering of treatment. His actions were a great inspiration to all those with whom he came in contact and were in keeping with the highest traditions of the Navy."

Dr. Keyserling graduated from the Medical College of the State of South Carolina, Charleston, in 1940 and entered the service Aug. 28, 1941.

# MISCELLANEOUS

## TYPHUS COMMISSION MEDAL AWARDED TO FOUR

The United States of America Typhus Commission Medal has been awarded by order of the President to Dr. Abdel Wahed El Wakil, Egyptian minister of health, and to three British brigadiers of the Royal Army Medical Corps for the help they have given representatives of the commission in investigating typhus in the Middle East and southern Italy. The members of the Royal Army Medical Corps are Brigadiers John S. K. Boyd, George B. Parkinson and Rudolf W. Galloway.

Dr. Wakil's citation reads:

"For meritorious services in connection with the work of the United States of America Typhus Commission. Ever since the arrival of the United States of America Typhus Commission group at Cairo, His Excellency, Dr. Wakil, as Minister of Health, has cooperated closely with the Commission. Through his interest and influence, facilities and opportunities were made available for the investigation of typhus fever in the laboratory and hospital, while extensive tests and new developments in methods for the control of typhus fever were made possible. The information derived from the results of these studies, conducted with the cooperation of Dr. Wakil, has been of benefit to the military forces."

The following is Brigadier Boyd's citation:

"For exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. From the time of the arrival of the first contingent of the United States of America Typhus Commission at Cairo in January 1943 and throughout the remainder of that year, Brigadier Boyd assisted the commission in formulating and effectuating programs for research on typhus fever and in development of measures for control. He furnished detailed information concerning the incidence of typhus fever in British forces in the Middle East in a manner which advanced coordination between American and British procedures for typhus control. Brigadier Boyd cooperated with the United States of America Typhus Commission in clinical studies, conducted to evaluate the properties of antityphus serum. In his capacity as a member of the Middle East Supply Center (Medical Section), Brigadier Boyd was extremely helpful and cooperative in arranging for distribution of typhus vaccine throughout the Middle East. Through his generous cooperation and through his many years of experience in the field of pathology, Brigadier Boyd as a consultant aided the Commission in practically every phase of its work in the Middle East."

Brigadier Parkinson's citation reads:

"For exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. During the epidemic of typhus in Naples, in the period of Dec. 20, 1943 to Feb. 20, 1944 Brigadier Parkinson actively cooperated with the United States of America Typhus Commission and rendered service of the greatest value in support of the typhus control program in southern Italy. Through his assistance to the Commission measures which prevented the spread of typhus in southern Italy were greatly strengthened."

Brigadier Galloway's citation follows:

"For exceptionally meritorious service in connection with the work of the United States of America Typhus Commission. During the period of from Dec. 20, 1943 to Feb. 20, 1944, the critical period of the outbreak of typhus at Naples and in southern Italy, Brigadier Galloway actively supported the work of the United States of America Typhus Commission in southern Italy. In addition, he took special steps to see that the danger of typhus fever was brought to the attention of all British medical officers in the area. He initiated an active typhus control program throughout the entire military forces in southern Italy."

## MALARIA EPIDEMIC DANGER IN U. S. IS REMOTE

Major O. R. McCoy, chief of the Tropical Disease Control Division in the Preventive Medicine Service of the Office of the Surgeon General of the Army, recently stated that he believed there is little danger of any serious epidemic of malaria in the continental United States traceable to soldiers returned from malarious battle fronts. It was reported recently that among soldiers the malaria situation has improved to a point where the effectiveness of combat units is no longer seriously threatened so long as "atabrine discipline" is properly maintained. Nevertheless some civilian authorities have indicated their fear that the return of malaria victims to the homeland might cause new epidemics or reestablish the disease endemically in areas which have not known it for several generations. Major McCoy stated that such fears are unwarranted. He pointed out that there is no reason to presume that mosquito control work, on which our principal dependence has been placed for malaria control, will not continue to operate effectively despite the presence of returned soldier victims. Brig. Gen. Hugh J. Morgan, head of the Medicine Division, who is chief consultant in medicine to Major Gen. Norman T. Kirk, Surgeon General of the Army, pointed out that the research work and experiences of the Army, Navy and other governmental agencies in malaria during this war have shed much light on many phases of the disease. "We are able to assure the American public that there is no reason for unfounded fears of malaria, if the disease is properly treated," he said.

Every soldier in a malarious area receives "suppressive treatment"—a small dose of atabrine six days a week, which controls the disease if he should contract it while in the lines and keeps him functioning as part of his unit. If the disease should develop, or if it appears after he is withdrawn to a nonmalarious rest area, he is given substantially larger curative doses, repeated each time the disease reappears. Most victims of vivax malaria have one relapse. At the same time the soldier is trained to protect himself against the mosquito which transmits the infection. He is supplied with mosquito netting, with mosquito repellents and "mosquito bombs" to clear out his tents or living quarters, and he is taught not to expose himself at sunrise or sunset.

## HEALTH NEWS FROM EUROPE

Public health work in Naples, after the initial cleanup and refitting of hospitals, was largely a matter of modernizing and supplementing the efforts of the Italian civilian government. Drug supplies and equipment were imported and modern developments in technics applied. Rapid treatment centers for victims of venereal disease were instituted and hospitals established for prostitutes. Wider case finding was stimulated and steps in education were undertaken.

Special emphasis also was laid on malaria control measures, on sanitation to prevent typhoid and dysentery infections and on antityphus work. Owing to overcrowding and lack of water and soap, an epidemic of lice borne typhus was building up when the Allies moved into Naples.

Typhus is a seasonal disease, and the number of cases usually begins to increase in the fall and winter and reaches its peak in April and May. It is particularly virulent among the underfed and poorly housed parts of the population, and during and after the last war it literally killed millions in eastern Europe. In Naples public health measures taken under the direction of the allied military government and the Typhus Commission of the United States stopped the epidemic cold for the first time in history. In January nearly 1,000 cases were reported, in February there were fewer than 200 cases, and in March case incidence was unimportant.

A few sporadic cases still occur in Naples, but the strenuous delousing campaign, use of repellent powders perfected for the U. S. Army and the immunization with U. S. Army vaccine of civilian public health workers proved effective. Exact figures on the death toll of the epidemic have not yet been assembled, but the rates ran about as usual, from 4 per cent among children to 54 per cent among persons over 70 years old. There were no cases among Allied soldiers. Naples had not had a reported case of typhus for fifteen years prior to this outbreak.

Records of the local régime were so confused that it was possible to form no clear picture of previous health averages for Naples, but current conditions in the city are described by the Army as good. Typical of the Fascist records was an instance applying to a Sicilian city in which certain buildings were listed as hospitals with so many beds allotted for civilian care. Some of the buildings so listed were actually houses of prostitution.

## LIEUT. OLIVER AUSTIN MISSING IN ACTION

Dr. Jean Austin, wife of Lieut. Oliver Austin, who has been missing in action since July 5, will carry on her husband's work. He vanished after taking off on a mercy flight July 5 from Churchill, Canada. His destination was Eskimo Point, 160 miles north, where he hoped to check an epidemic among the Eskimos and forestall danger of its spreading to the United States Army Air Force station near Churchill, where he was post surgeon. Searching parties found the plane wrecked on July 9 on a submerged reef in the Hudson Bay. The pilot's body was found but no trace of Lieutenant Austin. Dr. Jean Austin, who is resident surgeon at Cook County Hospital, Chicago, plans to leave for the isolated Hudson Bay outpost, 1,000 miles north of Winnipeg, where there are no other doctors for a distance of 600 miles, as soon as possible. Drs. Jean and Oliver Austin both graduated from Northwestern University Medical School, Chicago, in 1943 and 1941, respectively. Dr. Oliver Austin entered the service in September 1943.

## HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, September 23, page 242)

CALIFORNIA

Stanford University Hospitals, San Francisco. Capacity, 372; admissions, 9,588. Dr. Anthony J. J. Rourke, Superintendent (residents—surgery, obstetrics and gynecology, anesthesia, psychiatry, medicine, October 1).

ILLINOIS

Walther Memorial Hospital, Chicago. Capacity, 209; admissions, 5,665. Mr. William C. Martens Jr., Superintendent (3 interns).

MICHIGAN

Saginaw General Hospital, Saginaw. Capacity, 151; admissions, 3,961. Mrs. Kate J. Hand, Superintendent (intern).

MISSOURI

Christian Hospital, St. Louis. Capacity, 135; admissions, 3,201. Miss Agnes Heman, R.N., Superintendent (2 interns, 1 resident, mixed service).

NEW YORK

Beth David Hospital, New York City. Capacity, 187; admissions, 3,985. Mr. Harold M. Salkind, Executive Director (6 interns, October 1).

Ellis Hospital, Schenectady. Capacity, 470; admissions, 14,385. Miss Mary G. McPherson, R.N., Administrator (interns, resident, mixed service, October 1).

TENNESSEE

Protestant Hospital, Nashville. Capacity, 222; admissions, 4,895. Mrs. Elizabeth S. Hain, R.N., Superintendent (3 residents—mixed service).

WASHINGTON

Pierce County Hospital, Tacoma. Capacity, 239; admissions, 2,768. Dr. Burton A. Brown, Administrator (intern, October 1).

## WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Mayo General Hospital, Galesburg, Ill.: Blood Dyscrasias, Drs. Louis R. Limarzi and Howard L. Alt, October 4.

Camp Ellis, Camp Ellis, Illinois: Orthopedic Problems of General Interest, Drs. Edward L. Compere and Paul B. Magnuson, October 4.

Chanute Field, Rantoul, Ill.: Gallbladder and Liver Disease, Drs. Andrew C. Ivy and Walter L. Palmer, October 4.

# ORGANIZATION SECTION

## WASHINGTON LETTER

*(From a Special Correspondent)*

Sept. 25, 1944.

### Sensenich Urges Physical Fitness Program

A nationwide program of physical fitness, "not a Hitler youth movement, but routines of living for the purpose of hardening or attainment of physical vigor," was advocated by Dr. R. L. Sensenich of the Board of Trustees of the American Medical Association in his testimony before the Pepper committee. He was the first witness called at the opening of the past week's three day session, when the health condition of four to five million young American men found physically and mental unfit for the armed forces was under discussion.

"The greatest significance in reports of rejections for the armed forces," said Dr. Sensenich, "would seem to be in the notable lack of self interest and effort to secure or maintain a high level of mental and physical fitness. Those without recognizable defects fail to observe even the simplest program of regulation or discipline directed to the maintenance of good health. Routines of living for purposes of hardening or attainment of physical vigor are often referred to only with contempt."

Dr. Sensenich revealed that plans are well along for the broadest national activity to stimulate an interest in physical fitness. These are directed to homes, schools, churches, labor and industry and social and professional groups. This activity is being organized under leadership of a joint committee for the American Medical Association and the Committee on Physical Fitness of the Federal Security Agency. The work will be financed from many private groups. Dr. Sensenich estimated that approximately one out of six men were rejected because of remediable defects. Failure was most often due to lack of interest or willingness to accept treatment to correct conditions rather than to inability to obtain such medical service. He said that there are numerous provisions for those unable to pay for medical service. Final failure to obtain needed medical care, if it is sought, he said, generally rests on failure of some agency of government to carry out the purpose for which it is directed to assist those in need. On the question of availability of medical care, he said that the Procurement and Assignment Service for Physicians, Dentists and Veterinarians had done an excellent job in preventing serious depletion of medical personnel where their services were needed by the civilian population.

### Cutting Hospital and Medical Costs for Wage Earners

Dr. C. Rufus Rorem, director of the Hospital Service Plan Commission of the American Hospital Association, told the Pepper committee that if the government provided all necessary medical and hospital care for the indigent, doctors and hospitals could reduce their rates so much that all wage earners, even with very low incomes, could probably provide such care for themselves and their families. Dr. Rorem said that providing hospital and medical service for beneficiaries of public assistance, who at most make up no more than 15 per cent of the population, may seem a trivial procedure that avoids the basic need of adequate care for all the people, but he declared that it "strikes directly at the heart of an important economic problem of sickness. If the hospitals and physicians were individually (and as groups) relieved of financial responsibility for care of the indigent public," he said, "the subscription rates and hospital payments of the Blue Cross plans might be reduced to make participation possible by even the low income employed person and his dependents."

During the past week's hearing, views of labor leaders were expressed. The American Federation of Labor went on record as believing that the remedy to the national health problem lies in the principle of social insurance to apply to the health needs of all the people. Its spokesmen were in favor of the programs for hospitals and district hospital centers proposed by Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service.

In addition to the American Medical Association spokesmen, testimony was given by Professor Walter W. Palmer, chairman, Committee on Postwar Medical Service, American College of Physicians; Dr. Jean Curran, dean, Long Island College of Medicine and member of the board, Bingham Associates Fund; Dr. Samuel Proger, medical director, Pratt Diagnostic Hospital, Boston; Dr. Victor Heiser, chief medical consultant, National Association of Manufacturers; Dr. Leverett D. Bristol, chairman, Health Advisory Council, U. S. Chamber of Commerce; Dr. John P. Peters, secretary, Committee of Physicians for Improvement of Medical Care; Dr. George Stevenson, medical director, National Committee for Mental Hygiene; Dr. E. I. Robinson, president, National Medical Association; Dr. Ernst P. Boas, chairman, Physicians Forum; Dr. John Radford Boling, president, Florida State Medical Society; Dr. Perry Prather, general practitioner, Hagerstown, Md., and Dr. T. Henshaw Kelley, secretary, California Physicians Service.

### Commission on Children Urged by Pepper Committee

Three recommendations from the Pepper Subcommittee on Wartime Health and Education, made at the conclusion of sittings here this past week when the juvenile delinquency problem was discussed, were (1) Establishment of a commission for children and young people in the Office of War Mobilization, (2) fuller participation of children in the home front war effort through a central administrative authority and (3) national publicity and educational policy to acquaint the people of the United States fully with facts about children and their needs.

Juvenile delinquency, the hearings indicated, does not have any single cause, and it cannot be cured by any single remedy. Prevention is believed to be the soundest approach to the problem, the committee found from testimony of witnesses with experience in child health and welfare. Many governmental agencies are struggling with the problem, but overall leadership and coordination are needed. It was pointed out in a summary of testimony that, although there are at least twelve agencies in the federal government alone performing special services for children, the services of none of them, from the Children's Bureau to the Federal Bureau of Investigation, can be spared. Nor is there any federal agency known to the committee which is set up in a way to provide adequate leadership and coordination in delinquency prevention.

### Veterans Hospital Facilities Extended

Addition of 14,100 beds to the hospital system of the Veterans Administration has been given presidential approval, reports Brig. Gen. Frank T. Hines, chairman of the Federal Board of Hospitalization. This includes approximately 2,700 beds for mental patients, 7,900 for general medical and surgical care and 3,500 for tuberculous patients. This program is in addition to projects already approved for 17,400 beds in mental hospitals, 2,100 for general medical and surgical patients and 500 for the tuberculous. It is reported that most of the 20,000 beds are already under construction. Altogether, 34,100 beds are to be added to present Veterans Administration hospitals.

The latest program was approved after a nationwide study of prospective needs for veterans' hospitals, made jointly by the Veterans Administration and the Federal Board of Hospitalization. The study does not recommend individual sites for new hospitals or suggest where additions should be made. The way is cleared now for detailed planning by the Veterans Administration.

General Hines said that planning for future hospitalization of veterans must be continued. Locations will be chosen and hospitals designed two or three years in advance, the presidential approval having ordered that the whole program be reviewed frequently.

It is estimated that there will eventually be about 112,700 hospital beds available for veterans' care, and of the 27,700 to be made available for 1947 some 5,700 are for Veterans Administration patients in other federal, state and private hospitals. Adding some 12,800 beds that will be available for domiciliary care, a grand total of about 125,500 beds will be available ultimately to veterans.

# Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

## CONNECTICUT

**Society News.**—Dr. Joseph Jordan Eller, New York, will address the Waterbury Medical Society, November 9, on "Tumors of the Skin."

**Yale Library Acquires Herb Cabinet.**—The Yale Medical Library recently acquired the herb cabinet of Dr. Seth Bird (1733-1805), Bethlehem. The *Connecticut State Medical Journal* reported that no Connecticut physician of his time was more famous as a practitioner or medical preceptor than Dr. Bird. On June 14, 1941 the Beaumont Medical Club of Connecticut paid tribute to Dr. Bird in a visit to his house, which at that time was owned by Mr. William B. Sprague of New York City. On this occasion Dr. Creighton Barker, New Haven, presented a paper on Dr. Bird.

## DISTRICT OF COLUMBIA

**Personal.**—Dr. Hugh H. Hussey Jr. has been named chairman of a medical advisory committee appointed by the district office of price administration to pass on all applications for extra food rations for convalescents and persons in ill health. Other members of the committee are Drs. Roy L. Sexton, Roger O'Donnell Jr., Thomas F. Collins Jr. and James M. Moser.——Dr. Nelson Mercer, medical officer at Virginia Polytechnic Institute, Blacksburg, Va., has been named chief medical officer of the tuberculosis division of the Gallinger Municipal Hospital, effective August 1. Dr. Mercer succeeds Dr. Charles P. Cake, who resigned to enter the U. S. Public Health Service.——Dr. Herbert P. Ramsey has been appointed chairman of the health division of the Council of Social Agencies.

**Blood Bank Incorporated.**—The new community blood plasma bank, successor to the former Office of Civilian Defense blood bank, has been incorporated and will soon begin operation, according to *Medical Annals* (THE JOURNAL, June 24, p. 587). Dr. Roger M. Choisser is the new president of the bank, and members of the governing board include Dr. John A. Reed vice president, Dr. Charles Stanley White, Dr. Oscar B. Hunter, Dr. John M. Orem and Fred A. Walker of the Central Labor Union secretary-treasurer. Plans are to maintain bank supplies with contributions by patients after they recover or by their friends. It will be a nonprofit organization, and plasma will be available at the cost of production plus a donation of blood.

## ILLINOIS

**Personal.**—Dr. Joseph S. Maxwell, formerly missionary to Ethiopia, has been appointed physician at Wheaton College, it is reported.

### Chicago

**The Bevan Lecture.**—Dr. Howard C. Naffziger, professor of surgery, University of California Medical School, San Francisco, will deliver the sixteenth annual Arthur Dean Bevan Lecture before the Chicago Surgical Society, October 6. The subject of his lecture will be "Exophthalmos and the Thyroid: Experiences with Major Surgery of the Orbit."

**Mr. Shepard Joins Saunders Company as Art Editor.**—Mr. Willard C. Shepard, for many years connected with Rush Medical College and recently Rush associate in illustration studios at the University of Illinois College of Medicine, has been appointed art editor of W. B. Saunders Company, publishers, Philadelphia and London, in which position he will be available for consultation with authors in the preparation of illustrations for important textbooks. Mr. Shepard studied under the late Professor Max Brödel of Johns Hopkins University School of Medicine, Baltimore. Since 1916 he has been medical artist to Rush Medical College and the Presbyterian Hospital and for the past several years a general faculty member of the department of illustration of the University of Illinois College of Medicine. In his new work Mr. Shepard will concentrate on the more effective utilization of medical illustration to the benefit of medical education and clinical practice.

## INDIANA

**Personal.**—Dr. Love E. Pennington, superintendent of the Milledgeville, Ga., State Hospital, has been appointed to a similar position at the Madison State Hospital, North Madison.

**Medical School Affiliates with St. Elizabeth Hospital.**—An affiliation of St. Elizabeth Hospital, La Fayette, with the Indiana University School of Medicine, Indianapolis, for postgraduate instruction of the hospital's interns and staff has been announced by Dr. Willis D. Gatch, dean of the medical school. The affiliation, which was requested by Sister M. Amelia, superintendent, and Sister M. Renata, librarian, of the La Fayette hospital is the first of a series of joint arrangements by which the university's school of medicine will extend its facilities to local hospitals. The university will outline the training, send members of the faculty to conduct monthly meetings of interns and staff, and conduct examinations. The major portion of the instruction will be conducted by La Fayette physicians under Dr. Franklin S. Crockett, director of postgraduate instruction of St. Elizabeth Hospital.

## LOUISIANA

**New Diagnostic Center.**—The New Orleans Diagnostic Center has been opened in the old criminal courts building for the examination of women arrested for violations of the moral code. Women found to be infected with venereal diseases will be sent to the Delgado Memorial Hospital, a unit of Charity Hospital, New Orleans.

**Anton Carlson to Give New Lecture.**—Dr. Anton J. Carlson, professor emeritus of physiology, University of Chicago School of Medicine, will deliver the first lecture to be given at the Tulane University of Louisiana School of Medicine, New Orleans, October 2, under the newly created Alpha Omega Alpha Lectureship. Established by the Tulane University Stars and Bars chapter of Alpha Omega Alpha, one lecture will be given each academic year on the initiation of new members. Twelve Tulane students will be initiated on October 2 in addition to Dr. Hiram W. Kostmayer, dean of the medical school, who has been chosen an honorary member.

**Symposium on the Heart and Circulation.**—The Louisiana State University School of Medicine, New Orleans, will conduct a symposium on the heart and circulation, October 25-27. There will be no fee. Those interested are invited to attend. Among the speakers will be Drs. Maurice B. Visscher, University of Minnesota Medical School, Minneapolis, who will discuss cardiac efficiency and metabolism; Isaac Starr, University of Pennsylvania School of Medicine, Philadelphia, the ballistocardiograph, and Frank N. Wilson, University of Michigan Medical School, Ann Arbor, electrocardiography. Other speakers will be from Tulane University of Louisiana School of Medicine and Louisiana State University.

## MASSACHUSETTS

**Nutrition Instruction.**—The Harvard School of Public Health through its department of nutrition is expanding its teaching activities in nutrition. Nutrition A, consisting of three lectures per week for the first semester (November through February) covers the following subjects: proteins; fats; carbohydrates; minerals; vitamins; water; foods as sources of nutrients; nutritional requirements versus recommended allowances; losses of food nutrients in processing and the enrichment and fortification of foods; food habits; nutrition in relation to pregnancy, lactation, childhood, adolescence, dental health, medicine and blood regeneration; the use and abuse of commercial vitamins and mineral preparations; food fads versus facts; food budgeting; evaluation of nutritional status—dietary histories, laboratory methods, clinical studies, surveys; evaluation of diets; mass feeding; nutrition in industry; the nutritionist in a public health program; tools for nutrition education; nutritional problems of rehabilitation; nutrition in preventive medicine and public health. Nutrition B is offered throughout the entire year and consists of practical experience under supervision in food clinics in a community nutrition project or in experimental nutrition, depending on the student's qualifications and interests. Nutrition C, a weekly journal club and seminar in nutrition covering both fundamental and applied nutrition, meets throughout the academic year.

## NEBRASKA

**The C. W. M. Poynter Foundation.**—Alumni and friends of Dr. Charles W. M. Poynter, dean of the University of Nebraska College of Medicine, Omaha, have set up an endowment fund to establish the C. W. M. Poynter Foundation. The purpose of the foundation will be to create a Poynter lectureship and fellowship at the college of medicine and the

painting of a portrait of Dr. Poynter. Persons wishing to contribute to the fund should address Dr. Willson B. Moody, treasurer of the foundation, 530 Medical Arts Building, Omaha 2.

## NEW JERSEY

**Brandenburg Arrested for Illegal Narcotic Sale.**—Dr. Leopold W. A. Brandenburg, 57 years old, Union City physician who in recent years has been involved in several criminal complaints (THE JOURNAL, July 11, 1942, p. 893 and Sept. 12, 1942, p. 135), was arrested by federal narcotic agents, September 12, on a charge of illegally selling narcotics. He was held in $5,000 bail to await action by the federal grand jury. Assistant United States Attorney Charles Stanziale said the charges involved the sale of morphine to "four or five drug addicts over a period of time." The arrest was made by federal narcotic agents at the physician's office at 2802 Hudson Boulevard, Union City.

**Court Orders Physician Restored to Civilian Job.**—The U. S. Circuit Court of Appeals for the Third District, Philadelphia, in its first decision construing terms of the amendment to the Selective Service Act which requires employers to reinstate returned veterans to their jobs, ruled on September 12 that a medical director for an industrial corporation is an employee within the meaning of the law and entitled to his old job after discharge from the armed forces, according to the New York *Times*. The unanimous decision, written by Judge William H. Kirkpatrick, orders the General Cable Corporation at Perth Amboy, N. J., to reinstate Dr. Albert E. Kay, Perth Amboy, as the company's medical director. Dr. Kay enlisted in December 1942, after he was classified 1-A by his draft board, and attained the rank of captain in the army before he was discharged for physical disability. The company refused to rehire him, claiming that he was an independent contractor rather than an employee. It also contended that, since an employees' health association for which Dr. Kay had been medical examiner had engaged another physician and refused to take Dr. Kay back, it would be more beneficial to the employees if the same doctor was medical director for both the company and the association. Judge Kirkpatrick ruled that the law does not say a returned veteran must be an employee but is intended to protect "a position in the employ of an employer" and that Dr. Kay held such a position. As to the company's contention that there would be "loss of efficiency" and "additional expense" if separate doctors were employed by the company and the employees' association, Judge Kirkpatrick said that if such a claim was upheld it "would defeat the main purpose of the act and limit its operation to merely capricious or arbitrary refusals." The ruling was made on an appeal taken by Dr. Kay from a decision handed down by Judge Thomas F. Meaney of the New Jersey Federal District Court last February 7 dismissing a lawsuit the doctor had filed to compel the company to reinstate him.

## NEW YORK

**Cancer Teaching Day.**—On October 17 a cancer teaching day will be held at the Hermann M. Biggs Memorial Hospital, Ithaca, under the auspices of the Medical Society of the County of Tompkins, the state medical society and the division of cancer control of the state department of health. The speakers will be Drs. John H. Garlock, New York, and John J. Morton Jr., Rochester, on "Carcinoma of the Colon" and "Bone Tumors" respectively. An evening session will be addressed by Drs. Andrew H. Dowdy, Rochester, on "Epithelioma of the Skin" and Frank E. Adair, New York, "Carcinoma of the Breast."

**Graduate Lectures.**—On October 31 Dr. Frank L. Meleney, New York, will discuss "Penicillin Therapy" before the Nassau County Medical Society in Rockville Centre. Dr. Foster Kennedy, New York, discussed "The Neuroses: Related to the Manic-Depressive Constitution" before the Otsego County Medical Society, September 13, and Dr. Stockton Kimball, Buffalo, addressed the St. Lawrence and Jefferson county medical societies, September 14, on "The Diagnosis and Treatment of Malaria and the Dysenteries." These lectures are jointly sponsored by the state medical society and the state department of health.

### New York City

**Gastroenterology Conferences.** — Bellevue Hospital announces a series of conferences on gastroenterology beginning October 2 and continuing every Monday throughout the coming year. The sessions will consist mainly in the presentation of a clinical, pathologic and radiologic study of current abdominal cases that have come to operation or necropsy.

**Meeting on Diabetes.**—The New York Diabetes Association was addressed September 28 at the Blumenthal Auditorium, Mount Sinai Hospital, New York, by Drs. Martin G. Goldner and George Gomori, both assistant professors of medicine at the University of Chicago School of Medicine, on "Alloxan Diabetes" and "Histology of the Normal and Diseased Pancreas" respectively.

**Columbia Receives Penicillin.** — A grant of 100,000 Oxford units of penicillin was recently made to students of the College of Pharmacy at Columbia University for demonstration purposes, newspapers reported August 30. The drug is not suitable for human consumption, it was stated, but will prove an important addition to the laboratory to enable pharmacy students to gain first hand knowledge of the drug.

**Million Dollar Fund for Crippled Children.**—The Association for the Aid of Crippled Children, 580 Fifth Avenue, will receive about 10 million dollars under the will of Mrs. Annie Kirk Belding, who died September 4. The late Mrs. Belding's husband, Milo M. Belding, who died in 1931, had provided that the income from a trust fund after the death of his wife was to go to the association. The gift will be known as the Milo M. Belding Fund.

**Health Education.**—The Health Education Committee of the National Publicity Council for Health and Welfare Services, Inc., announces two health education clinics at the Hotel New Yorker, New York, October 2. One on printed matter, to be addressed by Milton Glover, Arthur Kudner Advertising Agency, and Horace H. Hughes, director of public information, Maternity Center Association, will be a practical analysis of printed pieces and posters in the health field. The second, on radio, will be a clinical discussion of the various types of radio programs; speakers will be Paul F. Lazarsfeld, director, Office of Radio Research, Columbia University; Harrison B. Summers, manager, public service division, Blue Network, and Herta Herzog, radio research department, McCann Erickson Advertising Agency.

**Mayor Vetoes Boric Acid Bill.**—Mayor Fiorello H. La Guardia recently vetoed the Vogel bill passed by the city council, which would require that all boric acid products be labeled "poison," according to the *Journal* of the Medical Society of the County of New York. The mayor based his veto on three main points:

1. He doubted that the jurisdiction or police powers of the city council covered the subject.
2. He regarded the question as one of a highly technical and medical nature, more properly and wisely entrusted to the board of health.
3. He preferred opinions of several medical authorities, including Dr. Ernest L. Stebbins, city health commisisoner, and Dr. Edward S. Godfrey Jr., state health commissioner.

It was stated that Mayor La Guardia found that the amendment to the sanitary code, recently passed by the city board of health and effective September 15, adequately meets all the precautions. The amendment governs the handling for purposes of selling of boric acid in the form of powder, crystals or solutions unless the container contains a label with the words "boric acid" and "Caution—Not for Internal Use Except as a Mouth Wash, Eye Wash or Douche."

## PENNSYLVANIA

### Philadelphia

**Personal.**—Gustav J. Martin, Sc.D., has been appointed research director of the National Drug Company; he has been assistant director in charge of the division of chemistry for the Warner Institute for Therapeutic Research, New York.

**Joint Medical Meetings.**—On September 13 the Philadelphia County Medical Society and the College of Physicians of Philadelphia opened their regular joint medical meetings with a talk, among others, by Dr. Reginald H. Smithwick, Boston, on "Experiences with the Surgical Treatment of Hypertension." Subsequent speakers will include:

John F. Enders, Ph.D., Boston, Immunity in Mumps (John Herr Musser Lecture), October 4.
Dr. Andrew C. Ivy, Chicago, The Gastrointestinal Hormones, Their Physiology and Application, November 8.
Dr. Stanley P. Reimann, The Cancer Problem as It Stands Today (Thomas Dent Mutter Lecture), December 6.
Dr. George W. Thorn, Boston, Asthenia of Adrenal and Thyroid Origin—Differential Diagnosis and Treatment, January 10.
Dr. Chester S. Keefer, Boston, Penicillin (Nathan Lewis Hatfield Lecture), February 7.
Dr. Joe V. Meigs, Boston, The Delay Period in the Diagnosis of Cancer, March 14.
Dr. Charles C. Wolferth, The Diagnosis of Coronary Artery Disease (Mary Scott Newbold Lecture), April 4.

## SOUTH CAROLINA

**Personal.**—Dr. Henry W. Tobias, for more than six years chief medical officer of the Veterans Administration Facility, Columbia, has resigned. Newspapers report that he will return to Washington to live.——Dr. Caleb W. Harris, Bishopville, recently completed fifty years in the practice of medicine.

**Executive Director Named for Ten Point Program.**—Mr. M. L. Meadors, Florence, a practicing attorney, has been elected executive director of the "ten point program" sponsored by the South Carolina Medical Association (THE JOURNAL, June 17, p. 505). The program was launched September 1 and is intended to raise the level of medical care for all people of South Carolina and keep the practice of medicine in the hands of the medical profession. The plan was approved at the recent annual meeting of the state medical association. Mr. Meadors formerly served as a member of the South Carolina House of Representatives.

**Refresher Courses.**—The Medical College of the State of South Carolina, Charleston, will conduct its third annual refresher course November 1-3 with the following speakers: Drs. Hilger Perry Jenkins, Chicago; Albert David Kaiser, Rochester, N. Y.; Eugene M. Landis, Boston; Bret Ratner, New York; Harold George Wolff, New York; George Edward Pfahler, Philadelphia; Paul Titus, Pittsburgh; Henry N. Harkins, Baltimore, and Julius Lane Wilson, New Orleans. Dr. Victor Johnson, Secretary of the Council on Medical Education and Hospitals, American Medical Association, Chicago, will address the banquet session on founders day, November 2, on "Medicine After the War." A special session on physical medicine will be held Friday in the Stark General Hospital Medical Library. The speakers will include Lieut. Col. Charles H. Fair, M. C., Major John G. Reid, M. C., Capt. Arthur M. Pruce, M. C., on "Physical Medicine and War Injuries" and Lieut. Elizabeth Kelly, P. T. A., and Captain Pruce on "Peripheral Nerve Injury: The Role of Splinting and Physical Therapy in Preoperative and Postoperative Care," a demonstration. A refresher course organized by the South Carolina Society of Ophthalmology and Otolaryngology will be conducted October 31 to November 2, among others, by Drs. Henry M. Goodyear, Cincinnati; James S. Shipman, Philadelphia; James W. White, New York, and Oscar V. Batson, Philadelphia.

## TEXAS

**Memorial to Dr. Randall.**—The amphitheater in the outpatient clinic building of the University of Texas Medical Branch, Galveston, has been named Randall Hall in honor of the late Dr. Edward Randall, professor emeritus of therapeutics, formerly chairman of the board of regents of the University of Texas and chairman of the board of directors of the Sealy and Smith Foundation. Dr. Randall died August 12.

**Changes in the Faculty at Baylor.**—The following appointments to the clinical faculty of the Baylor University College of Medicine, Houston, have been announced:

Dr. Theodore R. Hannon to associate professor, clinical surgery.
Dr. Frank O. McGehee to associate professor of orthopedic surgery.
Drs. John E. Skogland and Zidella M. S. Brener to associate professors, clinical neuropsychiatry.
Dr. Paul R. Stalnaker, associate professor, clinical urology.
Dr. A. Louis Dippel, Salt City City, to associate professor, obstetrics.

## WEST VIRGINIA

**Advisory Committee Named for Physical Restoration Program.**—A professional advisory committee to the physical restoration section of the West Virginia board of vocational education has been appointed by the West Virginia State Medical Association at the request of F. Ray Power, director of the new division "because of their outstanding contribution in a similar advisory capacity to the adult physical restoration program of the department of public assistance." Members of the committee are Drs. Thomas H. Blake, St. Albans, and Hugh A. Bailey and Thomas G. Reed, Charleston. The physical restoration program of the division of vocational rehabilitation includes provisions for surgical, medical and psychiatric care, hospitalization, physical therapy, occupational therapy and artificial appliances for clients who meet the criteria for eligibility for the services of the division and who are medically indigent. The duties and responsibilities of the professional advisory committee will include meeting from time to time to advise the division of rehabilitation and the supervisor of physical restoration with respect to general policies, setting of standards, selection of rates and methods of payment for services, supplies and prosthetic appliances, methods of medical reporting and record keeping by case workers, and assisting in interpreting to the professional personnel and institutions participating in the program the policies and procedures adopted by the state board of vocational education. Dr. Norman G. Angstadt, Fayetteville, director of the bureau of county health work of the state department of health, has been named as part time medical (administrative) consultant. His work will include day to day consultation with the supervisor of physical restoration in individual cases and specific medical problems, advice with regard to the execution of the policies for physical restoration, assistance to the supervisor in representing the state agency in its contacts with the medical and associated professions, assistance in the maintenance of the standards established by the state agency for the selection of physicians, hospitals and other medical personnel and facilities qualified to serve various types of cases and for payment to physicians, hospitals and others, and assistance in training the rehabilitation case work staff. The physical restoration program is already functioning with medically indigent clients being provided with such prosthetic appliances, surgical correction and therapeutic treatment as is necessary to restore them to physical fitness for jobs in industry, which is the objective of all physical restoration in the new division.

## GENERAL

**National Hearing Week.**—The week beginning October 22 has been designated National Hearing Week and will be devoted to the theme "Twenty-Five Years of National Service in the Cause of Better Hearing." The observance will be emphasized at the twenty-fifth anniversary meeting of the American Society for the Hard of Hearing at the Waldorf-Astoria Hotel, New York, November 10-12. This will be the eighteenth annual observance of National Hearing Week.

**Graduate Courses.**—The American College of Physicians has announced its autumn postgraduate courses, the first on cardiology, to be held at the Massachusetts General Hospital, Boston, October 2-7. Other courses include:

General Medicine, University of Oregon Medical School, Portland, October 9-14.
Internal Medicine, Center for Continuation Study, University of Minnesota Medical School, Minneapolis, October 9-14.
Allergy, Roosevelt Hospital, New York, October 16-21.
Special Phases of Internal Medicine, various Chicago institutions, October 23-November 4.
Special Medicine, various Philadelphia institutions, December 4-15.

**Dr. Hanson Joins Red Cross.**—Dr. Millard C. Hanson, who recently resigned as city health director of Richmond, Va., has been appointed medical director for the American Red Cross in charge of the Pacific area, with headquarters in San Francisco. Dr. Hanson will have charge of medical activities of the Red Cross in seven Western states and the territory of Alaska. Dr. Hanson, who graduated at Rush Medical College, Chicago, in 1923, served in the Richmond position for more than eight years.

**New Journal of Clinical Psychology.**—A new *Journal of Clinical Psychology* will make its appearance in January 1945 under the auspices of the University of Vermont College of Medicine, Burlington. Dr. Frederick C. Thorne, Brandon, Vt., is the editor. The new publication seeks to improve interprofessional relations between psychology and psychiatry. It will appear quarterly and will be limited to the publication of original research reports and of authoritative theoretical articles in the field of clinical psychology. The journal hopes to bring about closer understanding between psychology and the medical profession particularly in the borderline fields of psychometrics, guidance, counseling, child development and remedial work with speech, reading and special disabilities.

**Special Society Elections.**—Dr. Walter A. Younge, St. Louis, was chosen president-elect of the National Medical Association at its annual meeting in St. Louis, August 17, and Dr. Emery I. Robinson, Los Angeles, was installed as president. Other officers are Dr. John T. Givens, Norfolk, Va., general secretary, and Dr. Eugene T. Taylor, St. Louis, treasurer. The 1945 session is planned for Louisville, Ky.——Will Ross, a director of the Wisconsin Anti-Tuberculosis Association, Milwaukee, was recently chosen president-elect of the National Tuberculosis Association at its meeting in Chicago. Mr. Ross is the first layman to be elected to this office in thirty-two years and the second in the association's history.

**Cancer Society Changes Name.**—The American Society for the Control of Cancer, Inc., has changed its name to the American Cancer Society, Inc. In the future the society's lay organization, the Women's Field Army, will be known as

the Field Army in recognition of the fact that men as well as women are vitally concerned in the work. Mr. George B. Larson, formerly assistant secretary, Wisconsin State Medical Society, Madison, has joined the staff of the cancer society as director of publicity and public relations. The society plans to expand and extend its efforts not only to educate the public but to obtain from the public funds for cancer research, diagnosis and treatment, and education. The society will not itself conduct any research or own or operate any hospitals, clinics or laboratories but will raise and distribute funds to aid such institutions and projects as may be approved by its board of directors.

**Conference of Professors of Preventive Medicine.**—On October 2 the Conference of Professors of Preventive Medicine will hold its annual meeting in the Hotel Pennsylvania, New York, with Dr. Wilson G. Smillie, New York, acting as chairman and Leland W. Parr, Ph.D., Washington, D. C., secretary. Among the speakers will be:

Dr. Jacques P. Gray, Richmond, Va., Integration of the Teaching of Preventive Medicine with Clinical Teaching.
Dr. Dwight O'Hara, Boston, Teaching of Industrial Hygiene in the Department of Public Health and Preventive Medicine.
Dr. William W. Peter, New Haven, Conn., Use of Teaching Films in Preventive Medicine and Public Health.
Dr. Fred L. Moore, Brooklyn, Teaching of Social and Economic Factors in the Department of Preventive Medicine.
Dr. Henry E. Meleney, New York, Teaching of Tropical and Parasitical Diseases in the Department of Preventive Medicine.

**Course in Allergy.**—The American College of Allergists will conduct a graduate course in allergy at the Coronado Hotel, St. Louis, November 4-8, preceding the meetings of the American Academy of Pediatrics and the Southern Medical Association. Among the instructors will be:

Dr. French K. Hansel, St. Louis.
Dr. Ralph Bowen, Houston, Texas.
Dr. Herbert J. Rinkel, Kansas City, Mo.
Dr. Leon Unger, Chicago.
Dr. Rudolf L. Baer, New York.
Dr. Albert V. Stoesser, Minneapolis.
Dr. Thomas Wood Clarke, Utica, N. Y.
Dr. Jonathan Forman, Columbus, Ohio.
Dr. Homer E. Prince, Houston.
Dr. Cecil M. Kohn, Kansas City.
Dr. Michael Zeller, Chicago.
Dr. Frederick W. Wittich, Minneapolis.

Additional information may be obtained from Dr. Wittich, secretary-treasurer of the college, 401 La Salle Medical Building, Minneapolis 2, or Dr. Hansel, president, 634 North Grand Boulevard, St. Louis 3.

**Borden Award in Nutrition.**—The American Institute of Nutrition announces the Borden Award in nutrition in recognition of distinctive research by investigators in the United States and Canada which has emphasized the nutritive significance of the components of milk or of dairy products. The award will be made primarily for the publication of specific papers, but the judges may recommend that it be given for important contributions over an extended period of time. The award may be divided between two or more investigators. Employees of the Borden Company are not eligible for this honor. The formal presentation will be made at the annual meeting of the institute at Cleveland, May 8, 1945. To be considered for the award, nominations must be in the hands of Dr. Fredrick J. Stare, Harvard Medical School, Boston, chairman of the nominating committee, by Jan. 15, 1945. The nominations should be accompanied by such data relative to the nominee and his research as will facilitate consideration for the award.

**Incidence of Poliomyelitis.**—The peak of the 1944 epidemic of infantile paralysis for the nation as a whole apparently has been passed, and the incidence of the disease is now tapering off, according to the the National Foundation for Infantile Paralysis, September 18. The heaviest incidence of cases for the nation occurred in the week of September 2, when 1,683 cases were reported to the U. S. Public Health Service. The week of September 9 showed a drop to 1,487, and reports since then from epidemic states indicate that the decline is continuing. The total for the year up to September 9 was 10,959 cases, or more cases for the comparable period than at any time since America's worst epidemic year in 1916. This year's total for the first thirty-six weeks is 2,030 cases higher than for the same period in 1931, which to date is the second highest epidemic year. In combating the epidemic the National Foundation has sent out seven doctors, fifty physical therapists and more than 7 tons of wool as well as emergency financial relief. The American Red Cross has recruited approximately 700 nurses to supplement local facilities in epidemic areas. All twenty-six of the respirators owned by the National Foundation are still in active use.

**B Complex Award.**—Nominations are solicited for the 1945 award of $1,000 established by Mead Johnson and Company to promote researches dealing with the B complex vitamins. The recipient of this award will be chosen by a committee of judges of the American Institute of Nutrition, and the formal presentation will be made at the annual meeting of the institute at Cleveland on May 8, 1945. The award will be given to the laboratory (nonclinical) or clinical research worker in the United States or Canada who, in the opinion of the judges, has published during the previous calendar year, January 1 to December 31, the most meritorious scientific report dealing with the field of the "B complex" vitamins. The prize may be divided between two or more persons and it may be recommended to a worker for valuable contributions over an extended period but not necessarily representative of a given year. Membership in the American Institute of Nutrition is not a requisite of eligibility for the award. Nominations must be received by the secretary by Jan. 15, 1945. Arthur H. Smith, Ph.D., Wayne University College of Medicine, Detroit, is the secretary of the institute.

**Army Medical Library Meeting.**—On October 5 a formal program will be held at the Army Medical Library to observe the selection of the proposed site for a new building for the library. After an address of welcome by Norman T. Kirk, Surgeon General of the Army, the following will speak:

Lieut. Francis R. St. John, The Findings and Recommendations of the Survey Committee.
Col. Harold W. Jones, M. C., librarian, Army Medical Library, The Program of Reorganization in the Army Medical Library: Its Relation to War Activities and to Postwar Operation.
Mr. Archibald MacLeish, librarian, Washington, D. C., The Holmes Memorial.
Mr. Otto R. Eggers, architect, New York, Demonstration: A New Army Medical Library and Museum Building.

An afternoon session will be devoted to a discussion, among other things, of the program of restoration in Cleveland, the new classification system, the task of shelf listing and cataloguing, and a new library and museum building. An evening session at the Hotel Statler to honor consultants participating in the survey for the new library building will be addressed by Dr. Morris Fishbein, Editor of THE JOURNAL, and Dr. Reginald Fitz, Boston, consultant to the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, Washington, D. C. The Army Medical Library, which has been in existence for more than a hundred years, still occupies the building into which it moved in 1887. In 1941 Congress authorized a new library and museum, a project which will cost more than $4,000,000. In July 1942 the Cleveland branch was established.

**Meeting of Academy of Ophthalmology.**—The forty-ninth annual convention of the American Academy of Ophthalmology and Otolaryngology will be held at the Palmer House, Chicago, October 8-12, under the presidency of Dr. Lawrence T. Post, St. Louis. Included among the speakers will be:

Dr. Nelson M. Black, Miami, Fla., Empirical Treatment of Nyctalopia by a General Practitioner in Central America in 1912—A Reminiscence.
Dr. Joseph H. Kler, New Brunswick, N. J., An Analysis of Colds in Industry.
Dr. Moses H. Lurie, Boston, Deafness, Its Causes and What Can Be Done About It.
Dr. Sam E. Roberts, Kansas City, Mo., A New Sinus Syndrome.
Dr. John B. Erich, Rochester, Minn., Treatment of Laryngeal and Tracheal Stenosis.
Dr. Jack S. Guyton, Baltimore, Choice of Operation in Eyes with Primary Glaucoma and Cataracts.
Carl R. Brown, Ph.D., Ann Arbor, Mich., Configurational Aspects of Visual Acuity.
Drs. Harry S. Gradle, Chicago, Cecil S. O'Brien, Iowa City, and Daniel B. Kirby, New York, Enucleation and Substitute Operations—Discussion of Factors Important for Better Cosmetic Effect.
Dr. Raymond L. Pfeiffer, New York, Effect of Enucleation on the Orbit.
Capt. Benjamin F. Souders, M. C., and Capt. Harvey J. Forestner, D. C., Plastic Ocular Prostheses in Unusual Sockets.
Drs. Samuel J. Meyer and Paul Sternberg, Chicago, Surgical Management of Glaucoma in Correlation with Gonioscopy and Biomicroscopy.
Drs. William F. Hughes Jr. and William C. Owens, Baltimore, Extraction of Senile Cataract—A Statistical Comparison of Various Technics and the Importance of Preoperative Survey.
Dr. Dohrmann K. Pischel, San Francisco, Basic Principles of Retinal Detachment Operations, with Special Reference to the Eyeball Shortening Operation.
Lieut. Col. C. Dwight Townes, M. C., Operative Treatment of Heterophoria.
Dr. Edmund B. Spaeth, Philadelphia, Iridocyclitis, Complicating Cataract and Retinal Separation: Their Interrelationship.
Drs. Leighton F. Johnson and Louis Weinstein, Boston, Penicillin in Acute Surgical Mastoidectomy Wounds and with Primary Suture.
Major I. Jerome Hauser and Capt. Walter P. Work, M. C., Treatment of Sinusitis with Penicillin.
Dr. James S. Greene, New York, Speech and Voice Defects Due to Oral and Laryngeal Anomalies.
Capt. Michael L. Lewin, M. C., Late and Definite Treatment of War Injuries of the Face and Neck.

The program also includes a series of special courses in ophthalmology and otolaryngology. There will be individual

and sequential courses in both fields. A series of motion picture sessions will be run during the meeting. There will be alumni dinners and luncheons. The sixth annual meeting of the American Association of Eye, Ear, Nose and Throat Society Secretaries, Wednesday evening, October 11, will be devoted to extension study courses for eye, ear, nose and throat societies presented by Dr. William L. Benedict, Rochester, Dr. Gradle, Dr. Dean M. Lierle, Iowa City, and Dr. Albert D. Ruedemann, Cleveland. The American Orthoptic Council will hold an examination Saturday, October 7, at 2 o'clock at the Illinois Eye and Ear Infirmary. The American Board of Otolaryngology will hold its examinations at the Palmer House, October 4-7. Part I of the examination of the American Board of Ophthalmology will be held at the Edgewater Beach Hotel October 5-6 and part II at the Illinois Eye and Ear Infirmary October 7. The American Orthoptic Council and the American Association of Orthoptic Technicians will hold a joint symposium Sunday with the following speakers: Miss Jean Robinson, Memphis, on "Follow-Up in Orthoptics"; Dr. Frank D. Costenbader, Washington, D. C., "Analysis of Failures in the Treatment of Squint," and Miss Louisa Wells, Washington, "Orthoptic Fictions and Misconceptions." Other scientific programs will be concerned with the conservation of hearing, industrial ophthalmology and otosclerosis study group. A feature of the academy meeting will be a symposium on "Head and Face Pain" by Drs. Walter I. Lillie, Philadelphia; Arthur W. Proetz, St. Louis; Bayard T. Horton, Rochester, and Lewis J. Pollock, Chicago.

## MEDICAL BILLS IN CONGRESS

**Bills Introduced.**—S. 2144, introduced by Senator Andrews, Florida, proposes to provide more efficient dental care for the personnel of the United States Navy. It provides for a director of the Dental Corps of the Navy with the rank, pay and allowances of a rear admiral, provides for the establishing on ships and on shore stations of dental services to be administered under the senior dental officer, and authorizes the Secretary of the Navy to provide for a suitable number of dental technicians of appropriate ratings and ranks and for their training, detail, retention, supervision and direction by appropriate dental officers. S. 2163, introduced by Senator O'Mahoney, Wyoming, for himself and Senator Ferguson, Michigan, proposes to incorporate the Medical Women, Army-Navy Club. The objects of the corporation will be (*a*) to endow a memorial to honor nurses of the Army and Navy who served as officers of the armed forces in World War II, (*b*) to maintain a domicile for the comfort and service of all women who have served as commissioned officers of the Medical Departments of the Army and Navy, (*c*) to establish a club to aid in the continuance of the high morale of the medical women of the armed forces, (*d*) to provide a place of meeting and room accommodations and to promote entertainment for the best interest and efficiency of the medical women officers of the armed services and (*e*) to engage in such other activities for the promotion of the general welfare of the women commissioned officers as the corporation shall from time to time determine. H. R. 5265, introduced, by request, by Representative Pace, Georgia, provides for the development of better diets and an improved nutritional status for the people of the United States. H. R. 5388, introduced by Representative Bradley, Pennsylvania, proposes that no member of the land or naval forces of the United States shall be required to pay the cost of his transportation from an army or navy hospital in which he is a patient, or from any other hospital or institution in which he is undergoing treatment at the expense of the United States, to another such hospital or institution on the ground that such transfer was made at his own request. H. R. 5402, introduced by Representative Fay, New York, proposes an appropriation of $3,000,000 to construct a Veterans' Administration general medical and surgical hospital and domiciliary facility in the Borough of Manhattan, city of New York. H. R. 5414, introduced by Representative King, California, proposes to construct in Los Angeles a marine hospital for the accommodation of approximately 300 bed patients.

## LATIN AMERICA

**Health Activities in Latin America.**—*DDT Experiments.*—The Puerto Rico Insular Health Department is planning a series of experiments with DDT (dichloro-diphenyl-trichloroethane) insecticide to determine its efficiency and effects on human beings, livestock and agriculture, provided permission to purchase DDT can be obtained from the War Production Board in Washington. The department's malaria control bureau is preparing a report on projected experiments with DDT which will be submitted to the War Production Board. Experiments are planned with the insecticide in marshes for the destruction of mosquitoes.

*Personal.*—Dr. Emilio Mattar, who has been doing postgraduate work at Michael Reese Hospital, Chicago, returned to Brazil July 24. He has received an appointment to set up and direct a metabolism laboratory in the department of medicine of the University of São Paulo.

*Medical Congress.*—The second Pan American Conference on Leprosy will be held in Rio de Janeiro sometime in 1945, the exact dates to be chosen later.

*Program Against Typhus.*—The Guatemalan government has signed a contract with the United States for a cooperative campaign of sanitation to end typhus and eliminate malaria from the middle highlands of Guatemala. The New York *Times* reports that the cost was expected to be $600,000, of which Guatemala will provide $300,000 and will borrow an equal sum from the United States to be repaid in four years. The work will be carried out by both Guatemalan and American experts and technicians.

*Health in Panama.*—An excellent water system is the first reason for the success of public health work in Panama City, Colon and the Canal Zone, says Brig. Gen. Henry C. Dooling, M. C., chief health officer of the Panama Canal. Health conditions in these communities are highly satisfactory, it was stated, and will tend to remain so if the soundness of the water system, which was "hard to surpass," is maintained. Typhoid will be eliminated once sewage disposal facilities are removed from harbors and beaches, General Dooling stated. A joint sewage disposal board, made up of Canal Zone and Panama representatives, is now at work on long range plans for the coordination of sewage disposal in the Sabanas, Bella Vista, Panama City and Balboa districts. General Dooling also stated that Panama's high tuberculosis rate is attributable to poor housing conditions. Good results are expected from the extensive housing projects undertaken by the recently organized Urbanization Bank. The "liquidation" of Panama's rat population would expel another health menace confronting the people of the republic.

## FOREIGN

**Jeffries Prize Goes to Air Marshal Whittingham.**—The Institute of Aeronautical Sciences announced September 3 that the annual John Jeffries Prize for contributions to aeronautical medical research has been awarded to Sir Harold E. Whittingham, Director General, Medical Services of the Royal Air Force.

**Nutrition Research Unit.**—A human nutrition research unit has been established by the British Medical Research Council, London, with Dr. Benjamin S. Platt as director, *Science* reports. The unit is already engaged in investigations affecting colonial nutrition and is offering hospitality for study and research to nutrition workers from the colonies. It will also be available to advise colonial governments on technical questions.

**Ophthalmic Gold Medal.**—The Ophthalmological Society of Egypt announces that a gold medal will be awarded annually for the contribution deemed most valuable that year in the field of ophthalmology. A competitive essay will determine the award, which will be considered at the annual congress of the society. Additional information may be obtained from the Ophthalmological Society of Egypt, Dar el Hekma, 42 Kasr el Ainy Street, Cairo.

### Deaths in Other Countries

**Sir Hugh Mallinson Rigby,** "sergeant surgeon" to King George V from 1928 to 1932. He performed an operation credited with saving the king's life in 1928. Sir Hugh died July 17.——**Dr. Juan Carlos Llames Massini,** professor of obstetrics, Faculty of Medical Sciences of the University of Buenos Aires, and president of the Society of Obstetrics and Gynecology, Buenos Aires, died July 2.——**Sir Humphry Rolleston,** physician to the late King George the Fifth, died at his home in Surrey, September 24, aged 82.

## CORRECTION

**Iodized Table Salt to Combat Goiter.**—The Brazil Letter published in THE JOURNAL September 9, page 120, under the paragraph "Iodized Table Salt to Combat Goiter," stated that the product shall contain 10 mg. of iodine per kilogram of table salt. This presumably should have been 100 mg. of potassium iodide per kilogram, which conforms with the usual proportions followed in this country.

# Foreign Letters

## LONDON

*(From Our Regular Correspondent)*

Aug. 26, 1944.

### Questionnaire on the National Health Service

Some months ago the British Medical Association issued a questionnaire to the whole medical profession on the proposed national health service. Forms were sent to 53,728 physicians, and replies were received from 25,435, or 48 per cent. A large number of forms were sent to physicians in the fighting services. The following are the most important questions and a summary of the replies: Is your reaction to the white paper of the government favorable or unfavorable? The replies were 39 per cent favorable and 53 per cent unfavorable; 6 per cent did not know. Will the country's medical service be improved or suffer? Thirty-two per cent thought it would be improved, 12 per cent that it would be unaffected and 44 per cent that it would suffer. In 1943 the representative meeting of the British Medical Association voted that any national health service should be confined to 90 per cent of the public and exclude the 10 per cent upper income group. The white paper proposes that every one should be included but that no one should be required to use it. Should this basic proposal be accepted? It was accepted by 60 per cent and refused by 37 per cent. Should complete hospital and specialist services be available to every one in a general ward? Sixty-nine per cent of the answers were favorable to this. Should a patient who wanted to choose his own hospital or go into a private or semiprivate ward be permitted to pay a "hotel charge" and still receive medical attention under the service? The answers were 41 per cent affirmative and 54 per cent negative. Two out of every three voters approved the principle of health centers. Should the buying and selling of practices be maintained or abandoned on the assumption that adequate compensation is paid to existing owners? Thirty-three per cent were in favor of maintaining this practice and 56 per cent were against it. Thus the replies to the questionnaire reveal a greater difference of opinion than was supposed to exist.

### The Problem of the Rheumatic Child

The Cardiac Society and the British Pediatric Association have prepared a joint report on the care of rheumatic children. It states that acute rheumatism is primarily a disease of school age, that means of prevention are not known, and that efficient treatment depends on early diagnosis and methods known to limit cardiac damage. Three measures are proposed: (1) establishment of cardio-rheumatic clinics where the diagnosis can be established early and certainly, (2) organization of hospital schools where children can be treated as long as necessary while education continues and (3) compulsory notification of all cases of acute rheumatism, chorea and rheumatic heart disease. These steps might first be tried in large cities with medical schools where an appropriate staff can be found. The clinic should be held weekly and associated with a key hospital where laboratory facilities are available, the report states. The patients could be used for teaching, it is pointed out. The clinic should undertake supervision and follow-up, which should be continued into adult life. The staff should include physicians experienced in children's and heart diseases and should have the help of an assistant physician or registrar. Besides having access to a laboratory for sedimentation rates, blood counts and biochemical investigations, the clinic should be equipped with the means to measure heights and weights, to screen and x-ray hearts and to take electrocardiograms. The clinic physicians should arrange treatment to minimize cardiac damage, supervise the life of the children, collect data on prevention, direct adolescents and adults into suitable occupations, and educate doctors in the diagnosis of acute carditis and other heart diseases, the report says.

Hospitals for the treatment of children with cardiac rheumatism should be established throughout the country. The serious results of rheumatic carditis require that all cases of suspected acute rheumatism, chorea and rheumatic heart disease in children under the age of 16 should be made notifiable. A committee should be formed to keep the clinics in touch with one another and to coordinate research.

### Proposed Register of Specialists

In this country the status of specialists is well recognized, but they have no legal status apart from that of physicians in general. A special committee appointed by the General Medical Council (which, among other matters, controls medical registration) to consider the formation and maintenance of a register of specialists has issued its report. This recalls that last February the council reaffirmed its view that it is desirable and in the public interest that a register of specialists should be formed and maintained by the council. The immediate object of such a register would be to provide the authorities responsible for the organization of specialists' services as part of the proposed national health service and, in particular, the authorities for making appointments of specialists in that service, with an authoritative means of ascertaining whether or not any particular registered medical practitioner is eligible for appointment. The future object of the register of specialists would be to establish a standard of postgraduate medical qualification and experience for those who can be accepted for registration by the council.

### Institute for Research and Teaching of Ophthalmology to Be Established in London

The plan to establish at Oxford University a center of ophthalmic research and postgraduate study has been reported in THE JOURNAL (June 17, p. 507). A similar plan has now been formed in London. The council of the Royal Eye Hospital has decided to establish an Institute of Ophthalmology where teaching and research can be carried out systematically and coordinated with the work of laboratories and general hospitals. The institute, with an independent board of governors, will work under the patronage of the Archbishop of Canterbury, the Archbishop of Westminster and other prominent persons. To ensure that the institute is broadly established, panels of advisers have been set up to help in planning and carrying out the work. These include eminent scientists, physiologists, physicians, surgeons and ophthalmologists. The courtesies of the institute will be available to all ophthalmologists, and offers of cooperation will be welcomed.

### The F.R.C.S. in Ophthalmology

The fellowship of the Royal College of Surgeons is the highest surgical qualification in England and is held by the leading ophthalmic surgeons, who have obtained it by the same examination that general surgeons undergo. But, in this age of specialism, an innovation has been proposed. The Council of British Ophthalmologists has asked the council of the Royal College of Surgeons to grant a special diploma of the college as a higher diploma in ophthalmology. The council of the college has given this request careful consideration and agrees that a special examination would be more suitable than the usual final fellowship examination for those specializing in this important branch of practice. It is also clear to the council that the present regulations for the "F.R.C.S. with Ophthalmology" are too exacting in that candidates are required to have passed the usual final examination of the fellowship. The council members therefore agree that there should be a special

final examination for the fellowship for those specializing in ophthalmology and that, since the standard would be comparable to that of the usual final examination, successful candidates should rank as fellows of the college, with all their privileges. Under the existing charters the council has no right to make this arrangement, but it is prepared to seek it. It is anticipated that two ophthalmic surgeons will be required on the examination board. It is proposed that they should be fellows of the college. Two other surgical members of the examination board would be selected from the general surgeons on the court of examiners and would take part in some portions of the theoretical examination.

### Woman Professor of Obstetrics and Gynecology

Mrs. Bertram Lloyd has been appointed to the chair of obstetrics and gynecology in the University of Birmingham, left vacant by Sir Harold Beckwith Whitehouse, who died when he was president of the British Medical Association. Mrs. Lloyd graduated in science in 1914 and in medicine two years later at Birmingham University. She then became medical officer to the Maternity Hospital and the Midland Hospital for Women. In 1920 she took the fellowship of the Royal College of Surgeons and became obstetric surgeon to the Maternity Hospital and acting surgeon to the Hospital for Women. In 1930 she married Mr. Bertram Lloyd, who is professor of forensic medicine and lecturer on clinical surgery at the University of Birmingham. Mrs. Lloyd was appointed assistant to the chair of obstetrics before succeeding to it.

## AUSTRALIA

*(From Our Regular Correspondent)*

July 17, 1944.

### Deficiency of Thiamine in the Australian Diet

The average diet eaten by the Australian is estimated to contain about 1.2 mg. of thiamine daily per "adult male." Many diets are much lower than this, and there are probably few people in Australia whose thiamine intake is up to the National Research Council standard of 1.8 mg. per day for the moderately active man.

The Nutrition Committee of the National Health and Medical Research Council has given consideration to measures designed to increase the thiamine content of the Australian ration. These studies were directed along two lines: (*a*) the raising of the percentage of extraction from flour and (*b*) the enrichment of the flour with synthetic nutrients.

The first line of study showed that there were considerable technical difficulties associated with the manufacture of high extraction flour. Most of the flour milled in Australia is "straight run" flour. Milling practice in Australia does not divide the flour into separate types, as is the practice in other countries, nor is the general standard of milling machinery in Australia as good as elsewhere. Many Australian mills fall far short of what is necessary for the manufacture of good flour even at normal percentages of extraction. The redesigning of the machinery for making high extraction flour in Australia would necessitate the use of skilled manpower, which is not at present available. Furthermore, the climatic conditions and the long distances in Australia are not conducive to the long storage of high extraction flour.

The so-called mill offal (bran and pollard) is more than fully utilized in the feeding of poultry and dairy animals, and the production goal for the product of these animals has increased considerably. The estimated requirement of these mill by-products is already in excess of the available supply. New Zealand, moreover, requires about 60,000 tons yearly of bran and pollard.

On the basis of an 80 per cent extraction flour the amount of vitamin $B_1$ supplied by bread made from this flour would be about 50 per cent greater than that provided by bread made from the present white flour of 70-72 per cent extraction. The use of an 80 per cent extraction flour would increase the total thiamine intake of the Australian citizen living on an average diet by about 10 per cent. This 10 per cent would come almost entirely from the pollard fraction of the offal. This would mean that up to two thirds of the supply of pollard would be withdrawn and the remaining third would not have the same nutritional value for animal feeding as that now produced. Accordingly, the committee did not feel justified in recommending the introduction of a flour of high extraction (80-85 per cent) for the manufacture of bread in lieu of white flour of 70-72 per cent extraction.

The baking interests in Australia are opposed to the baking of either whole meal or high extraction flour. They fear that such bread, in that it differs from that acceptable to the Australian palate by custom, would tend to be consumed in smaller quantities. Their activities have been directed toward an advertising campaign to encourage the consumption of more white bread. This campaign has been notorious for its misleading, inaccurate statements.

The Nutrition Committee of the National Health and Medical Research Council was opposed to the enrichment of flour with synthetics on the ground that "there is no evidence that vitamin $B_1$ produces its complete nutritional effect by its own unaided physiological action."

Estimations of the thiamine content of Australian wheat and flour during one season have shown that the thiamine content of Australian wheat is higher than it is in wheats from other countries; but, even so, bread made from Australian flour provides only 0.34 microgram of thiamine per nonfat calory. As it is considered that complete metabolism is achieved only with a ratio of 0.5 microgram of thiamine per nonfat calory, it will be seen that the Australian white bread does not carry sufficient thiamine for its own complete oxidation.

The Australian army in its field bakeries produces bread of either 40 per cent wheat meal or 6 per cent wheat germ. This bread is estimated to provide 43 micrograms of thiamine per ounce. This compares with white bread at 25 micrograms per ounce and whole meal bread at 71.

The Australian army and air force have banned the sale of "ready to eat" breakfast foods by army canteens. This was done as a result of analyses which showed that there was an average thiamine destruction in the factory preparation of 94 per cent in the leading brands. The practice had developed of army units substituting the thiamine rich oatmeal and wheat meal issue by such devitaminized foods. No "ready to eat" breakfast food in Australia is enriched by synthetic nutrients.

The increasing taste and demand for sugar among service personnel also is causing some concern.

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## *Marriages*

HENRY L. HARRIS, Los Angeles, to Miss Mary Wallace Austin in Alabama, June 15.

LAWRENCE J. O'NEIL to DR. CORNELIA ST. ROMAIN, both of New Orleans, May 23.

NELSON A. WOLFE to Miss Betty Denny, both of New Albany, Ind., August 24.

EDWARD G. RIVET, New Orleans, to Miss Judith McMahon of Clinton, La., June 10.

JAMES V. KAUFMAN to Miss Elizabeth H. Toye, both of New Orleans, June 3.

JAMES M. BUIE, Mertens, Texas, to Miss Margaret Stell of Irene in July.

VERNON N. BALOVICH, New Orleans, to Miss Sue Fernandez, May 25.

# Deaths

**Edward Clarence Moore** ✠ Los Angeles; University of Southern California College of Medicine, Los Angeles, 1904; clinical professor of surgery at his alma mater; founder member of the American Board of Surgery; member of the American Surgical Association and the American Urological Association; member and past president of the Pacific Coast Surgical Association; fellow of the American College of Surgeons; at one time on the staff of the Mayo Clinic, Rochester, Minn.; during World War I served as major and consulting surgeon in the medical corps, American Expeditionary Forces, stationed at Base Hospital number 26; past president of the state fish and game commission; chief surgeon and a founder of the Moore-White Clinic; on the staffs of the California, Cedars of Lebanon and Good Samaritan hospitals; died July 10, aged 62, of carcinoma of the left kidney with metastasis to the lungs.

**Lester Low Watson** ✠ Passed Assistant Surgeon, U. S Public Health Service Reserve, Milton, Mass.; Boston University School of Medicine, 1928; member of the Massachusetts Medical Society; fellow of the American College of Physicians; formerly instructor in medicine at his alma mater; served as visiting physician and secretary of staff, Massachusetts Memorial Hospitals, Boston, and visiting physician, Milton Hospital and Convalescent Home; formerly examiner, tuberculosis division, Boston Health Department; examining physician, Randolph District, Massachusetts Selective Service; formerly chief of the Milton Civilian Defense; recently stationed at the U. S. Public Health Service Hospital, Sheepshead Bay, Brooklyn, where he died June 14, aged 43, of coronary occlusion.

**Ralph Farnsworth Harloe** ✠ Brooklyn; Long Island College Hospital, Brooklyn, 1918; also a pharmacist; since 1937 assistant clinical professor of surgery at his alma mater; fellow of the American College of Surgeons; past president of the Brooklyn Surgical Society; served as special examiner for the U. S. Civil Service Commission and the U. S. Veterans Bureau in Washington, D. C.; served during World War I; on the staffs of the Sea View Hospital, Staten Island, Long Island College Hospital, Kingston Avenue, Bushwick, Evangelical Deaconess and Bay Ridge hospitals; director of thoracic surgery at the Kings County Hospital, where he died July 31, aged 64, of coronary occlusion.

**William Figures Lewis** ✠ Colonel, U. S. Army, retired, Pasadena, Calif.; University of Maryland School of Medicine, Baltimore, 1893; entered the army as an assistant surgeon in 1893; became a major in the medical corps of the U. S. Army in 1908, a lieutenant colonel in 1916 and a colonel in 1917; retired Dec. 15, 1922 after twenty-nine years' service; received the Distinguished Service Cross for bravery in action during the Philippine Insurrection; served in the Boxer Rebellion in China and the Spanish-American War; chief surgeon of the Allied Expeditionary Forces in Siberia during World War I; died September 10, aged 78, of arteriosclerotic heart disease.

**Michael Milton Lucid,** Syracuse, N. Y.; Syracuse University College of Medicine, 1896; member of the Medical Society of the State of New York; member of the House of Delegates of the American Medical Association in 1915; fellow of the American College of Surgeons; served during World War I; colonel in the medical reserve corps of the U. S. Army not on active duty; formerly on the staff of the Cortland County Hospital, Cortland, and a founder of the Homer Hospital, Homer; died in the Hospital of the Good Shepherd, Syracuse University, July 11, aged 75, of lobar pneumonia, generalized arteriosclerosis and acute nephritis.

**James Cornelius Austin,** Spencer, Mass.; College of Physicians and Surgeons, Baltimore, 1896; member of the Massachusetts Medical Society; past president of the Worcester District Medical Society; chairman of the board of health for twenty-five years and school physician for many years; died July 10, aged 69, of cerebral hemorrhage.

**Paul Harold Bikle** ✠ Mifflinburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1904; formerly on the staff of the University Hospital, Philadelphia; served as company surgeon for the Williamsport District of the Pennsylvania Railroad; died in the Harrisburg Hospital, Harrisburg, July 30, aged 65, of coronary occlusion.

**James Walter Van Blaricum** ✠ Minneola, Kan.; Kansas City (Mo.) Medical College, 1901; for many years member of the school board; died June 4, aged 70, of bronchial asthma.

**George Proctor Cooper** ✠ Angels Camp, Calif.; Cooper Medical College, San Francisco, 1906; served as county health officer and county physician; chief examiner for the Calaveras County Selective Service Board during World Wars I and II; commissioner, Angels Fire Department; for many years president of the board of education; superintendent of the Calaveras County Hospital; died in St. Luke's Hospital, San Francisco, July 18, aged 64, of carcinoma of the colon.

**Channing Ellery Dakin,** Mason City, Iowa; Bennett College of Eclectic Medicine and Surgery, Chicago, 1899; member of the Iowa State Medical Society; fellow of the American College of Surgeons; served as health officer of Mason City; attending surgeon and chief of staff, St. Joseph's Mercy Hospital; died July 8, aged 68, of carcinoma of the colon.

**Alice Mabel Woods Fiddes,** Morgan Hill, Calif.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1885; died July 24, aged 83, of arteriosclerotic heart disease.

**James Berry Gilbert** ✠ Tulsa, Okla.; Mississippi Medical College, Meridian, 1912; served as county physician; on the staffs of the Hillcrest Memorial and St. John's hospitals; died July 4, aged 55.

**Fred Thomas Hauser** ✠ Purcellville, Va.; Medical College of Virginia, Richmond, 1933; on the staffs of the Loudoun County Hospital, Leesburg, and the Winchester Memorial Hospital, Winchester; died July 25, aged 41, of brain tumor.

**William James Latimore,** Herminie, Pa.; Eclectic Medical Institute, Cincinnati, 1897; examiner of schools and in 1902 school director; died in the Westmoreland Hospital, Greensburg, July 16, aged 72, of peptic ulcer.

**John H. Runyon,** Seymour, Iowa; College of Physicians and Surgeons, Keokuk, 1890; member of the Iowa State Medical Society; died July 30, aged 77, of coronary thrombosis.

**Frederick Parker Scribner,** Manchester, N. H.; Dartmouth Medical School, Hanover, 1909; member of the New Hampshire Medical Society and the American Society of Anesthetists, Inc.; on the staffs of the Hillsborough County General Hospital, Grasmere, and the Elliot Hospital; died in Bedford July 17, aged 60, of coronary thrombosis.

**Isaac Grafton Sieber Jr.** ✠ Passed Assistant Surgeon, U. S. Public Health Service Reserve, Cleveland; Temple University School of Medicine, Philadelphia, 1932; intern and a staff member at the St. Alexis and Glenville hospitals; on the staff of the Booth Memorial Home and Hospital; entered the U. S. Public Health Service in 1942 and was assigned to the Coast Guard in Boston; died August 5, aged 39, of carcinoma of the left lung.

**Lewis C. Snell,** Neosho, Mo.; University Medical College of Kansas City, 1900; died in St. John's Hospital, Joplin, July 20, aged 79, of myocarditis.

**Charles Ira Stephen,** Ansonia, Ohio; Starling Medical College, Columbus, 1897; member of the Ohio State Medical Association; past president of the Darke County Medical Society; served in the medical corps of the U. S. Army during World War I; a member of the board of education and for many years a member of the county board of health; on the staff of the Wayne Hospital, Greenville, where he died July 13, aged 70, of carcinoma of the liver.

**M. Eugene Street** ✠ Glendon, N. C.; College of Physicians and Surgeons, Baltimore, 1893; on the staff of the Moore County Hospital, Pinehurst, where he died July 14, aged 78, of coronary occlusion.

**Basil Mitchell Taylor,** Portland, Ind.; University of Louisville (Ky.) Medical Department, 1892; member of the Indiana State Medical Association; for many years secretary of the Jay County Medical Society; health officer of Portland; formerly state senator in Kentucky; served as secretary-treasurer of the staff of Jay County Hospital; died July 10, aged 74, of coronary occlusion.

**John Quincy Thomas** ✠ Conshohocken, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; served two terms as president of the Conshohocken town council and for many years as president of the Mary H. Wood Park commission; a trustee of the Norristown State Hospital, Norristown, for eighteen years; on the staffs of the Bryn Mawr Hospital, Bryn Mawr, and the Montgomery Hospital, Norristown, where he died July 26, aged 69, of cerebral arteriosclerosis.

**George S. Trotter,** Olney, Ill.; Kentucky School of Medicine, Louisville, 1898; served as president of the board of education and on the inductees examining board during World War I; died July 23, aged 75, of arteriosclerosis.

# DIED WHILE IN MILITARY SERVICE

**Melbourne Wells Boynton** ✠ Chicago; Rush Medical College, Chicago, 1935; diplomate of the National Board of Medical Examiners; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; served an internship at St. Luke's Hospital; chief resident and later on the attending staff of the Chicago Lying-In Hospital and Dispensary; resident in obstetrics at the Chicago Maternity Center and the University of Chicago Clinics; instructor of obstetrics and gynecology, University of Chicago School of Medicine; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Aug. 26, 1935; began active duty on March 7, 1941, in charge of obstetrics and gynecology at the William Beaumont General Hospital, El Paso, Texas; later promoted to captain, major and lieutenant colonel; chief, medical safety division with headquarters at the Army Air Forces, Office of Flying Safety, Winston-Salem, N. C.; killed in an experimental parachute jump from high altitude at Clinton County Army Air Base, Wilmington, Ohio, August 19, aged 39.

**George Kremer Rhodes,** San Francisco; Johns Hopkins University School of Medicine, Baltimore, 1915; diplomate of the National Board of Medical Examiners and founder member of the American Board of Surgery; associate clinical professor of surgery at the University of California Medical School; member of the California Medical Association, Western Surgical Association and Pacific Surgical Association; fellow of the American College of Surgeons; associate visiting surgeon, San Francisco Hospital, and assistant chief surgeon, San Francisco Emergency Hospital; volunteer surgeon of the American Ambulance Corps in France during World War I; commissioned a lieutenant colonel in the medical reserve corps of the U. S. Army on Dec. 20, 1940; began extended active duty on May 15, 1942; served overseas with the 30th General Hospital (affiliated unit of the University of California Medical School) and later became surgical consultant in the southern district of the European theater, where he died July 23, aged 54, of coronary occlusion.

**Lloyd Thomas Sussex** ✠ Havre, Mont.; Northwestern University Medical School, Chicago, 1926; diplomate of the National Board of Medical Examiners; fellow of the American College of Surgeons; intern at the Wesley Memorial Hospital, Chicago, from July 1925 to April 1927; later fellow in surgery at the Mayo Foundation in Rochester, Minn.; served on the staffs of the Sacred Heart and Kennedy Deaconess hospitals; commissioned a lieutenant in the medical corps of the U. S. Naval Reserve on Feb. 10, 1937, promoted to lieutenant commander on June 30, 1942 and commander on Oct. 1, 1942; spent eighteen months in the South Pacific area, four months at Guadalcanal, some time in New Zealand and was in the battle of Tarawa; had been given honorable mention for having performed operations on 140 wounded men during seventy-two consecutive hours; died in the U. S. Naval Hospital, Farragut, Idaho, June 8, aged 45, of coronary thrombosis.

**Martlin Pendry Smith,** Erie, Pa.; University of Pittsburgh School of Medicine, 1933; member of the Indiana State Medical Association; specialist certified by the American Board of Otolaryngology; served an internship at the Pittsburgh Medical Center, a residency in obstetrics at the Elizabeth Steel Magee Hospital, Pittsburgh, a residency in eye, ear, nose and throat at the Buffalo General Hospital and the Children's Hospital in Buffalo, and the New York Polyclinic Medical School and Hospital, New York; formerly a member of the visiting staff of the Ball Memorial Hospital, Muncie, Ind.; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on June 2, 1941; later promoted to lieutenant and lieutenant commander; died in the African area on July 5, aged 35, of injuries received in an automobile accident.

**Morton Atherton Cundiff,** Somerset, Ky.; University of Louisville School of Medicine, 1941; served an internship at St. Joseph Hospital, Lexington; commissioned a first lieutenant in the medical corps, Army of the United States, on May 26, 1942; began active duty on July 2, 1942; later promoted to captain; flight surgeon in the Air Corps; died in the European theater of operation July 4, aged 29, of injuries received in an airplane accident.

**Foster Leonard Dennis** ✠ Dodge City, Kan.; Jefferson Medical College of Philadelphia, 1921; served during World War I; fellow of the American College of Physicians; commissioned a major in the medical corps, Army of the United States, on Feb. 24, 1943; formerly stationed at the Walter Reed General Hospital, Washington, D. C., and formerly attached to the Twenty Second General Hospital; died June 26, aged 48, of cerebral hemorrhage.

**Judge William Fuller,** Assistant Surgeon Lieutenant (jg) U. S. Navy, Jacksonville, Fla.; Tulane University of Louisiana School of Medicine, New Orleans, 1942; served an internship at the Naval Hospital, where he had been on the staff; drowned at sea in the Atlantic area January 7, aged 28.

**Julian Leo Hargrove** ✠ Bartow, Fla.; Emory University School of Medicine, Atlanta, Ga., 1924; served in the U. S. Navy during World War I; superintendent of the Polk County Hospital for many years; commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve on March 28, 1942; executive medical officer of the Deland Naval Air Station; died July 3, aged 46, of injuries received when his automobile struck a bridge abutment on the Deland-Daytona Beach Highway.

**Charles Albert McNeil** ✠ Toledo, Ohio; University of Michigan Medical School, Ann Arbor, 1923; completed an internship and served on the staff of St. Vincent's Hospital; served during World War I; commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve on July 2, 1942; senior medical officer of the Naval Officer Procurement in St. Louis; had also been stationed in Chicago; died in the U. S. Naval Hospital, Great Lakes, Ill., July 27, aged 51, of hypertension and heart disease.

**Leslie Bertram Roberts,** Brooklyn; New York University College of Medicine, New York, 1938; served an internship at the Jewish Hospital and a residency in the Montefiore Hospital for Chronic Diseases and the Bellevue Hospital in New York; formerly a research fellow in medicine at his alma mater; commissioned a first lieutenant in the medical corps, Army of the United States, on Aug. 21, 1942 and began active duty on Sept. 2, 1942; promoted to captain in June 1943; chief flight surgeon, Army Air Base, Bruning, Neb.; killed in an airplane accident in Naper, Neb., August 3, aged 28.

**Gregory Albert Skully,** Detroit; Wayne University College of Medicine, Detroit, 1937; member of the Michigan State Medical Society; interned at the Eloise Hospital, Eloise; commissioned a first lieutenant in the medical corps, Army of the United States, on June 19, 1942 and subsequently promoted to captain; began active duty on July 4, 1942; flight surgeon in the air corps; in charge of the eye, ear, nose and throat division at the Syracuse (N. Y.) Army Air Base Hospital; died in the Station Hospital, Syracuse, N. Y., July 13, aged 32, of pneumonitis complicated by bronchial asthma.

**Edwin Theodore Tellman,** Palmyra, N. Y.; Rush Medical College, Chicago, 1936; member of the Medical Society of the State of New York; served an internship and residency at the Rochester General Hospital, Rochester; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Nov. 23, 1936; subsequently promoted to captain and major; died in the Letterman General Hospital, San Francisco, July 16, aged 34, of agranulocytosis with generalized hemorrhage and bronchopneumonia.

**Ralph Milton Wyatt** ✠ Hiawatha, Kan.; University of Kansas School of Medicine, Kansas City, 1933; served as health officer of Brown County; commissioned a first lieutenant July 21, 1942 and began active duty in the medical corps of the Army of the United States on Aug. 22, 1942; later promoted to captain; flight surgeon; died in an airplane accident in Aldershot, England, June 8, aged 38.

# Bureau of Investigation

## STIPULATIONS

### Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

**Foster's Wonder 30 Minute Corn and Callous Remover.**—This is sold by Stomar Products Company, Kansas City, Mo. In November 1943 the concern and its advertising agency stipulated with the Federal Trade Commission to cease representing that the product promotes healing, and disseminating any advertisement which did not warn that care should be taken not to allow the preparation, full strength, to remain too long in contact with the corn, lest its corrosive action extend to the underlying tissue.

**H-B Cough Drops.**—The C. A. Briggs Company, trading as H. B. Sales Company, Cambridge, Mass., stipulated with the Federal Trade Commission in November 1943 that it would cease describing its cough drops by the term "Hospital Brand," which might give the erroneous impression that the product is made in accordance with a formula prescribed or endorsed by a hospital. Further, it agreed to cease representing that the cough drops contain vitamin A, that their use will impart the benefits derived from the consumption of that vitamin, or that they purify and soften all hardened places in the throat.

**Imperial Lax-101.**—This is put out by William H. Braun and Alice C. Braun, trading as Imperial Brands Company, Chicago. A stipulation which they entered into with the Federal Trade Commission in December 1943 provided that they would cease representing that the product is a gentle or mild laxative and will move the bowels easily without irritation to the intestinal walls; that it will change an unhealthful evacuation to a healthful one; that it contains no habit-forming drugs, that delayed evacuation will poison the system and lower bodily resistance and that their preparation will remedy such conditions. Further, they agreed to discontinue any advertisement which did not reveal that Imperial Lax-101 should not be used when abdominal pains or other symptoms of appendicitis are present; provided, however, that such advertisements need only contain the statement, "Caution: Use Only as Directed" when the labeling carries a warning to the same effect.

**Lax-Aid.**—Frank M. Spors and Esther Spors, trading as the Spors Company, LeCenter, Minn., who distribute this product, stipulated with the Federal Trade Commission in November 1943 to discontinue any advertisements which did not reveal that the product should not be used when abdominal pain, nausea or other symptoms of appendicitis are present; provided, however, that such advertisements need only contain the statement, "Caution: Use Only as Directed" if and when the directions for use, when appearing in the labeling, contain a warning to the same effect.

**Mamie's New Discovery Scalp Ointment.**—In December 1943 one Mamie Wilson of Los Angeles stipulated with the Federal Trade Commission that she would cease representing that this product will prevent loss of hair or baldness, counteract conditions causing hair loss, or be a cure for dandruff or other scalp ailments except to the extent that it may mitigate itching of the scalp; that it will nourish or stimulate the hair roots or make the hair grow or take on new life, or will tone the oil glands of the scalp or the blood corpuscles, or have any other effect on the latter.

**NR Tablets or Nature's Remedy.**—The Lewis-Howe Company, St. Louis, which sold this product, entered into a stipulation concerning it with the Federal Trade Commission in November 1943. In this the concern agreed to discontinue any advertising which failed to reveal that the preparation should not be used when abdominal pain, nausea or other symptoms of appendicitis are present; provided, however, that it would be sufficient if the advertising made the statement, "Caution: Use Only As Directed" if the instructions for use on the label or elsewhere in the labeling should contain a warning to the same effect.

**Othine Face Bleach.**—This is put out by the Othine Corporation of Buffalo, N. Y. In February 1944 that concern stipulated with the Federal Trade Commission that it would discontinue any advertisement which did not reveal that the product should not be applied at any one time to an area of skin larger than that of the face and neck; that too frequent applications over excessive periods of time should be avoided; that adequate rest periods between series of treatments should be observed; that the bleach should not be used where the skin is cut or broken, and that in all cases a proper patch test should be made to determine whether the user is allergic or sensitive to the preparation. The stipulation provided, however, that it would be sufficient for future advertisements to contain only the statement, "Caution: Use Only as Directed" if the instructions for use on the label contain a warning to the same effect.

# Correspondence

## QUESTIONABLE VALUE OF VITAMIN C FOR HAY FEVER

*To the Editor:*—Almost every year, with the approach of the pollen season, the public becomes repeatedly apprised of some new "cure" or remedy for this affliction. Through the medium of newspapers, magazines and radio such an impression is made on people that they ask their physicians for these drugs or, what is worse, use them themselves prior to obtaining a medical opinion. One year ionization of the nose was popular; then phenol cauterization; a few years ago potassium chloride was the rage. Careful observation by allergists subsequently disproved the value of these remedies.

This year it is vitamin C. My associates and I undertook a study of this work, commencing with the tree pollinating season in April 1944 in the New York area. It subsequently included the grass and early part of the ragweed season. Some persons were pure hay fever sufferers, others had pollen asthma. The two sexes were about equally represented. Ages varied from 4 to 73 years. Occupations were diversified. The average adult daily dose was 500 mg. of ascorbic acid given in divided doses for a two week period.

It is important to know that pollen symptoms may change remarkably during the day. A victim may be in much distress and quickly be relieved spontaneously, depending on the pollen content in the air, which is quite variable during the day. In appraising results, it is therefore necessary to utilize a large enough group of cases, observe them particularly through the peak of the pollen seasons, and make comparisons with at least one previous year. This we carried out on 48 patients.

Our preliminary findings absolutely do not warrant the recommendation of vitamin C in pollinosis, either as the sole measure of therapy or in conjunction with the injection treatment. We are making observations on allergies other than pollinois, as well as noting the effects of vitamin C on the peak of the ragweed season, but its value on tree, grass and early ragweed sufferers is highly questionable. In my opinion, therefore, vitamin C cannot be regarded as a useful form of therapy in pollinosis.

David Louis Engelsher, M.D., New York.
Chief in Allergy, Bronx Eye and Ear Infirmary,
Morrisania City Hospital and Fordham Hospital.

# Medical Examinations and Licensure

## COMING EXAMINATIONS AND MEETINGS

### BOARDS OF MEDICAL EXAMINERS
### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in The Journal, Sept. 23, page 758.

### NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Parts I and II. Various centers, Nov. 13-15. Part III. Various centers, September or October. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

### EXAMINING BOARDS IN SPECIALTIES

American Board of Anesthesiology: *Written.* Part I. Various centers, Jan. 19. Final date for filing application is Oct. 21. Sec., Dr. P. M. Wood, 745 Fifth Ave., New York 22.

American Board of Internal Medicine: *Written.* Feb. 19. Final date for filing application is Dec. 15. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

American Board of Obstetrics and Gynecology: *Written. Part I.* Various centers, Feb. 3. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

American Board of Ophthalmology: Los Angeles, January. Final date for filing application is Oct. 1. New York, June. Chicago, October, 1945. Final date for filing application is Dec. 1. Sec. Dr. S. Judd Beach, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* Chicago, Oct. 4-7. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Oral.* New York, April 14-15. Final date for filing application is Dec. 15. Chicago, May 19-20. Final date for filing application is Jan. 19. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY: *Oral.* New York, December. Final date for filing application is Sept. 30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington 6, D. C.

# Bureau of Legal Medicine and Legislation

## MEDICOLEGAL ABSTRACTS

**Workmen's Compensation Acts: Silicosis Not an "Injury by Accident."**—For thirteen years during the winter months Johnson was employed in a rock or stone crushing plant operated in South Dakota by the defendant. Eventually he contracted pneumonoconiosis, or silicosis. Later he instituted an act at law against his employer, based on the theory that he had contracted the pulmonary dust disease referred to during the course of his employment because the employer had negligently failed to maintain in its plant an adequate ventilating system or to install exhaust fans and dust chambers or other suitable contrivances for the removal of dust. The employer moved to dismiss the action on the ground that the injury, if any, suffered by the workman was a compensable "injury by accident" under the workmen's compensation act of South Dakota and that consequently any action based on that injury must be instituted under that act and not at common law. The trial court overruled the motion, and the employer appealed to the Supreme Court of South Dakota.

The sole question here involved, said the Supreme Court, is whether or not, under the circumstances, the injury suffered by the workman is an "injury by accident" within the meaning of the workmen's compensation act, which provides that a compensable "injury" or "personal injury" shall mean "only injury by accident arising out of and in the course of the employment, and shall not include a disease of any form except as it shall result from the injury." SDC 64.0102 (4). The complaint filed by the workman describes an injury resulting from repeated inhalations of silica over an extended period of time. In *Frank* v. *Chicago, M. & St. P. R. Co.*, 49 S. D. 312, 207 N. W. 89, 91, in which a thrombus or clot of blood in the femoral vein was under consideration, in construing the language quoted from SDC 64.0102 (4), supra, this court said "Before he can recover it must appear that some mishap, some untoward and unexpected event, occurred without design; that some accidental injury was suffered, traceable to a definite time, place and cause." In *Mellquist* v. *Dakota Printing Co.*, 51 S. D. 359, 213 N. W. 947, 949, in which an acute heart attack was under consideration, we said "The requirements of *Frank* v. *Chicago, M. & St. P. R. Co.*, 49 S. D. 312, 207 N. W. 89, 91, have been met, in that the uncontradicted statements of two physicians show that the injury was of a definite, sudden occurrence, directly traceable to a strain." In *Johnson* v. *La Bolt Oil Co.*, 62 S. D. 391, 252 N. W. 869, this court receded from the view that the cause of the injury must be some unforeseen and unusual operation, act or condition and held that it is sufficient if the injury itself is unexpected. That we did not, by that decision, recede from the view that the injury must be traceable to a definite time, place and cause is implicit in the language of the decision and is made clear in the subsequent case of *Meyer* v. *Roettele*, 64 S. D. 36, 264 N. W. 191, 194. The record in that case discloses an injury as a result of ingesting bacillus botulinus. It was there said:

> We are of the view that a disease may be an "injury by accident" within the meaning of our statute. The exclusion is of any disease which is not an accidental injury or which does not result from such injury. It is generally recognized that accident as contemplated by the workmen's compensation law is distinguished from so-called occupational diseases which are the natural and reasonably to be expected result of workmen following certain occupations for a considerable period of time. On the other hand, if the element of suddenness or precipitancy is present and the disease is not the ordinary or reasonably to be anticipated result of pursuing an occupation, it may be regarded as an injury by accident and compensable. . . . The inception of the disease under the evidence in the instant case is attributable to the unexpected and undesigned occurrence of the presence of the poisonous toxin and is assignable to a definite time, place and circumstance. In our opinion death was the result of an accidental injury.

Subsequent to these pronouncements the legislature reenacted the quoted section of the workmen's compensation act as a part of the revision of 1939. It is presumed the legislature intended that this language should be likewise construed as we construed it prior to its reenactment.

The employer contended, however, that the interpretations made by the Supreme Court referred to had been overruled by the court in its opinion in *Hanzlik* v. *Interstate Power Co.*, 67 S. D. 128, 289 N. W. 589. In that case, said the Supreme Court, we held compensable under the workmen's compensation act encephalitis contracted following a period of exhausting work and exposure. Because the particular work and exposure described in the evidence in that case extended over a period of five days, the employer argues that this court has eliminated the factors of "suddenness and precipitancy" as a condition precedent to the compensability of an injury under the compensation act. That we did not so intend is indicated by our language in that case, for there we said:

> Viewing the record in the light of the tests announced in *Meyer et al.* v. *Roettele et al.*, supra, we are of the opinion that findings based upon substantial evidence support the conclusion that claimant's disease constituted an "injury by accident." His collapse came suddenly upon the heels of unusual exertion, exposure and exhaustion as an untoward, unexpected and unanticipated result of pursuing his employment."

The Supreme Court accordingly held that, since the complaint failed to describe an injury attributable to a definite time and cause or circumstance, it did not describe an "injury by accident" within the meaning of the compensation act and that accordingly the trial court was correct in ruling that an action under the common law was properly maintainable. The order of the trial court was accordingly affirmed.—*Johnson v. Concrete Materials Co., 15 N. W. (2d) 4 (S. D., 1944).*

# Society Proceedings

## COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 8-12. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Academy of Pediatrics, St. Louis, Nov. 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Hospital Association, Cleveland, Oct. 2-6. Mr. George P. Bugbee, 18 East Division St., Chicago, Executive Secretary.

American Public Health Association, New York, Oct. 3-5. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.

Annual Conference of State Secretaries and Editors, Chicago, Nov. 17-18. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

Association of American Medical Colleges, Detroit, Oct. 23-25. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, New York, Nov. 2-4, Col. James M. Phalen, Army Medical Museum, Washington 25, D. C., Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 5-7. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.

Indiana State Medical Association, Indianapolis, Oct. 3-5. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis 4, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 17-20. Dr. Arthur G. Sullivan, 16 N. Carroll St., Madison, Wis., Managing Director.

International College of Surgeons, U. S. Chapter, Philadelphia, Oct. 3-5. Dr. Desiderio Roman, 250 South 17th St., Philadelphia, Secretary.

Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 2-4. Dr. William M. Korth, 1115 Grand Ave., Kansas City 6, Mo., Secretary.

Midwestern Section of American Federation for Clinical Research, Chicago, Nov. 2. Dr. Richard H. Lyons, University Hospital, Ann Arbor, Mich., Secretary.

Oklahoma City Clinical Society, Oklahoma City, Oct. 23-26. Dr. L. C. McHenry, 512 Medical Arts Bldg., Oklahoma City, Secretary.

Omaha Mid-West Clinical Society, Omaha, Nebraska, Oct. 23-27. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha 2, Secretary.

Southern Medical Association, St. Louis, Mo., Nov. 13-16. Mr. C. P. Loranz, Empire Building, Birmingham 3, Ala., Secretary.

Virginia, Medical Society of, Richmond, Oct. 23-25. Miss Agnes V. Edwards, 1200 E. Clay St., Richmond 19, Secretary.

# Current Medical Literature

## AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

### American J. Obstetrics and Gynecology, St. Louis

**47**:741-888 (June) 1944

*Ovarian Fibromas: Clinical and Pathologic Study of 283 Cases. M. B. Dockerty and J. C. Masson.—p. 741.
Effect of Pregnancy on Blood Pressure in Normotensive and Hypertensive Dogs. S. Rodbard and L. N. Katz.—p. 753.
Transplantation of Abdominal Fascia for Relief of Urinary Stress Incontinence. W. E. Studdiford.—p. 764.
Capillary Counts, Capillary Disappearance Pressure and Cutaneous Lymphatic Flow in Normal Pregnancy. E. Roberts, J. Q. Griffith Jr. and R. A. Kimbrough Jr., with the technical assistance of Anna Callaghan.—p. 776.
Endometriosis Interstitiale, with Report of 3 Cases. J. R. Miller and R. Tennant.—p. 784.
*Elderly Primipara. Katherine Kuder and D. G. Johnson.—p. 794.
Possible Significance of Vaginal Smears in Diagnosis of Certain Disturbances of Pregnancy. W. Schuman.—p. 808.
Suggested Proposal for Classification of Toxemias of Pregnancy. P. Titus.—p. 817.
Intravenous Administration of Vinbarbital Sodium for Induction of Obstetric Amnesia. J. R. Evans.—p. 821.
Congenital Vaginal Occlusion of Cervix. W. T. Dannreuther.—p. 826.
Vesical and Rectal Incontinence in Same Patient: Complete Laceration of Perineum Following Childbirth and Large Vesicovaginal Fistula Following Abdominal Panhysterectomy. L. E. Phaneuf.—p. 835.
*One Day Sulfonamide Treatment of Chronic Gonorrhea in Female. H. Strauss, S. Goldstein, E. A. Horowitz and E. Meyer.—p. 838.
Torsion of Ovarian Cysts in Children. Ruth Ellis Lesh.—p. 845.
Pelvic Actinomycosis Treated by Surgery and Roentgen Ray, with Recovery. M. Rashbaum and Harriet C. McIntosh.—p. 849.
Ophthalmia Neonatorum, with Special Reference to Sulfonamides in Treatment and Continued Importance of Silver Preparations in Prevention. C. Berens.—p. 855.

**Ovarian Fibromas.**—Dockerty and Masson examined records from the Division of Surgical Pathology and the section on pathologic anatomy of the Mayo Clinic for tumors bearing the designation fibroma, fibromyoma, fibroblastoma, xanthofibroma and the like, affecting the ovary. Approximately 350 such tumors had been found at surgical exploration or at necropsy on patients seen at the clinic from 1907 to 1942 inclusive. Pathologic material was next secured and the tumors were studied for data pertinent as to side, size, color, consistency, degree of encapsulation, edema and formation of cysts. Associated pathologic lesions of the uterus and fallopian tubes were recorded when these tissues were present. Multiple blocks were cut from the tumors and attempts were made to select regions which included also (in the same block) material from ovarian substance. These blocks were placed in solution of formaldehyde U. S. P. diluted 1:10, cut at a thickness of 10 microns on a freezing microtome, and stained routinely with hematoxylin and eosin. When indicated, special stains such as the Galantha stain for mucin, sudan III stain and the van Gieson stain for hyaline substance were also employed. Several thousand sections were thus made available for study. Preliminary microscopic "scouting" eliminated the occasional examples of granulosa tumor, theca cell tumor, Krukenberg tumor and Brenner tumor. A fair number of adenofibromas was found and similarly deleted. There remained 312 ovarian fibromas occurring in a group of 283 patients. These 312 tumors accounted for 5 per cent of all ovarian tumors surgically removed at the Mayo Clinic. Ovarian fibroma was never encountered before the age of puberty, and this observation has been taken to indicate an origin possibly based on a desmoplastic reaction to the hemorrhage of ovulation or ovarian endometriosis. Fibroma did not produce specific diagnostic symptoms, and rarely was it possible for the clinician to go further than to say "ovarian tumor," "solid ovarian tumor" and so forth. Abdominal ascites in 51 cases and hydrothorax in 2 cases suggested the existence of a malignant process, but the patients never presented the picture of cachexia. Most of the tumors were solid, white and invested by a smooth capsule free from adhesions. Many of the tumors were edematous, and a number of these had undergone degenerative changes with central cysts or "geodes." The common denominator relating to both ascites and formation of cysts was a weeping edema effected through partial obstruction of the venous return. Hydrothorax was rare. In 90 per cent of cases the tumor was unilateral. Bilateral fibroma-like tumors sometimes proved to be metastatic tumors of the Krukenberg type. A yellowish color suggested theca cell tumor, especially in cases in which postmenopausal bleeding was noted. In others the yellow color resulted from fatty metamorphosis. A grayish brown color and firm consistency were noted in several tumors that later proved to be of the Brenner type. A brownish color and soft consistency indicated malignant change, which occurred in 1 per cent of the tumors studied. Microscopically, both cellular and fibrous types appeared to arise from the spindle cells of the ovarian cortex, with hemorrhage as a possible inciting element.

**Elderly Primipara.**—Kuder and Johnson present a study of the histories of 830 elderly primiparas delivered in the Women's Clinic of the New York Hospital during the eleven year period from 1932 to 1943. The total number of deliveries during this period was 30,880. The elderly primiparas accounted for 2.68 per cent of the total. About half of the 830 elderly primiparas were between 35 and 36 years of age, whereas 104, or 12.5 per cent, were 40 or over. The incidence of toxemia of pregnancy in the elderly primiparas was 13.98 per cent as compared with 7.29 per cent in the clinic as a whole. Myoma uteri occurred in 5.9 per cent as compared with 1.9 per cent in the total clinic. Although the incidence of contracted pelves in this series was 13.0 per cent in contrast to 9.2 per cent for the total clinic, the greatest difference appeared in the incidence of funnel pelvis. This type made up 45.3 per cent of the contracted group in the elderly primiparas and 28.2 per cent in the clinic. When the elderly primipara goes two weeks or more past the expected date of delivery, the incidence of prolonged labor is 28.91 per cent, of operative delivery 69.87 per cent and of infantile mortality 24.09 per cent, as compared with 17.59 per cent, 55.54 per cent and 7.64 per cent respectively for the entire group of elderly primiparas. The average duration of labor for this group was 20.41 hours. The average duration of labor for primiparas in the clinic is 18.0 hours. The incidence of operative deliveries was 55.54 per cent and of cesarean section 13.38 per cent, while in the clinic as a whole these incidences are 24.3 per cent and 2.9 per cent respectively. The gross infantile mortality was 7.64 per cent as compared to 3.7 per cent for the clinic as a whole. The maternal mortality was 7.2 per thousand pregnancies as compared to 1.6 per thousand pregnancies for the total clinic. The mere fact that a patient is an elderly primipara is not in itself an indication for cesarean section. If, however, there is an added factor which under any circumstance would be an indication for cesarean section or would increase the fetal mortality rate, this operation is justifiable.

**One Day Sulfonamide Treatment of Chronic Gonorrhea in the Female.**—Strauss and his associates state that beginning in January 1943 patients sent to their service at the Kingston Avenue Hospital with a culture report positive for the gonococcus were given sulfonamide medication routinely for only one day. A complete history, physical and gynecologic examination, complete blood count and urine analysis were first recorded. Patients were confined to the hospital but were ambulatory. They were on a general hospital diet. Fluids were forced before, during and after chemotherapy, the average intake being over 2,000 cc. The day preceding the administration of the sulfonamide each patient was given 32 Gm. of sodium bicarbonate. The first group of 96 patients was given sulfadiazine 6 Gm. during a single day—half at 9 a. m. and the other half at 3 p. m. An equal amount of sodium bicarbonate was administered at the same time. The second group of 97 patients was treated identically except that 8 Gm. of sulfadia-

zine was administered during one day. The third group comprising 88 patients was given 8 Gm. of sulfathiazole in the same fashion. In all cases cultures and spreads were taken from the urethra and cervix (Skene's and Bartholin's, when indicated) the day following treatment and once or twice weekly during their hospital stay. The patients were examined gynecologically each week by the resident staff and also by the visiting staff working independently. The period of observation following chemotherapy averaged thirty days. The administration of sulfadiazine or sulfathiazole during a single day to hospitalized women with cultures positive for the gonococcus was followed by the disappearance of gonococci in 86.6 to 90.9 per cent of the cases. There was no significant difference of results following 8 Gm. of sulfathiazole, 8 Gm. of sulfadiazine or 6 Gm. of sulfadiazine. There was a difference in response of patients of the Negro and white races, the failures being three to four times greater in the white race. The authors are not ready to advocate the general use of the "one day treatment" of gonorrhea and believe that it should be used only for hospitalized patients when time is at a premium.

## Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

**51**:669-794 (June) 1944

Actinomycosis of Vertebrae. M. Lubert.—p. 669.
Hereditary Factors in Multiple Congenital Deformities: Report of 2 Cases. A. A. Hobbs Jr.—p. 677.
Osteochondritis of Capitellum (Panner's Disease). H. C. March.—p. 682.
Roentgenologic Findings in Bilateral Symmetrical Thinness of Parietal Bones (Senile Atrophy): Report of Case with Review of Literature. A. K. Wilson.—p. 685.
Encephalographic Appearance in 2 Cases of Pontine Glioma in Children. W. J. Gardner and E. W. Shannon.—p. 697.
*Lesions of Acromioclavicular Joint Causing Pain and Disability of Shoulder. A. Oppenheimer.—p. 699.
Traumatic Separation of Upper Femoral Epiphysis: Birth Injury. P. C. Kennedy.—p. 707.
Oscillating Pleural Hernia. C. G. Lyons, F. G. Bell and L. S. Ellenbogen.—p. 720.
Simplified Method of Bronchography. P. A. Robin.—p. 724.
Use of Modified Opaque Barium Sulfate Mixture in Roentgenography of Colon. M. H. Poppel and Celia Bercow.—p. 727.
Treatment of Accessible Malignant Tumors with Short Distance Low Voltage Roentgen Rays. D. W. Smithers.—p. 730.
*Concentration Method of Radiotherapy for Cancer of Mouth, Pharynx and Larynx: Report of Progress. M. Cutler.—p. 739.
Radium Dosage for Linear Sources: Table and Nomogram. B. S. Wolf.—p. 747.

**Acromioclavicular Joint Causing Pain of Shoulder.**—According to Oppenheimer, among the various lesions which may induce persistent or recurrent pain and disability of the shoulder, those involving the acromioclavicular joint have received little attention, although they seem to be common. Arthritis of the acromioclavicular joint causes pain in the shoulder, often radiating into the arm, wrist and fingers, with limitation of the movements involved in bringing the arm above shoulder level, across the chest and onto the back. Other signs and symptoms are not characteristic, as they may be produced by bursitis, myositis, traumatic lesions of the muscles, tendons and bones of the shoulder and radicular neuritis caused by disease of the cervical spine. The diagnosis is determined by the x-ray appearances in a majority of cases. During the past eleven months, when special attention was paid to acromioclavicular lesions, 28 cases were observed. A review of roentgenograms of the shoulder made before that time seems to show that this incidence is the usual one. Acromioclavicular lesions were about eight times as frequent as humeroscapular arthritis, three times as frequent as subdeltoid and subacromial bursitis combined, nearly as frequent as the various traumatic lesions of the muscles and tendons of the shoulder girdle and about one half as frequent as radicular neuralgia caused by disease of the cervical spine. All the patients were referred to the roentgenologic department because various modes of therapy, such as heat applications, analgesics, splints and injections of a local anesthetic into the deltoid region, had failed to produce permanent relief. Short wave therapy was ineffective. Small doses of roentgen therapy were applied. In some of the patients pain began to subside after the second irradiation; in others, six to eight treatments were required to bring about complete or almost complete relief. The movements of the arm in the shoulder usually became normal about ten days after disappearance of the pain. A decrease of the capsular enlargement was noted on roentgenograms in all instances.

**Concentration Method of Radiotherapy.**—Cutler presents the results achieved by the new method of irradiation called concentration radiotherapy. During the five year period 1938 to 1943, 290 cases were treated, divided as follows: cancer of the pharynx and larynx 116 cases, cancer of the mouth 116 cases, cancer of the tongue 38 cases, cancer of the accessory nasal sinuses 20 cases. The basis of the method of concentration is the use of large daily doses over a comparatively short treatment period (ten to eighteen days). The total dose is sufficient to produce an "epithelitis" and in some instances an epidermitis, and there is reason for believing that the total dose under the given conditions constitutes a maximum irradiation. It is not certain that all the factors are the most favorable, except that the increase in the daily dose and diminution in the total treatment period has caused regression, disappearance and apparent cures of lesions that have failed to respond to the former divided dose technic. Roentgen rays or radium may be used. This method has resulted in the eradication of the more radioresistant carcinomas of the mouth, pharynx and larynx which have failed to respond to the previous methods of external irradiation. The initial disappearance and apparent cures have been observed in a group of intrinsic squamous carcinomas of the larynx which are generally regarded as radioresistant and for which surgery is usually claimed to be the only effective treatment. In many of these cases the only alternative to radiotherapy was complete laryngectomy. A radiotherapeutic test has been developed for certain borderline cases of intrinsic cancer of the larynx in which a decision between radiotherapy and laryngectomy is difficult. Approximately half the full dose of treatment is given in six days as a test of the sensitivity of the lesion. This is followed by an interval of fifteen days of observation. The degree of regression of the lesion at the end of the twenty-one days can be used as a reasonably accurate index of the radiocurability of the lesion. If the response to the first course of treatment is adequate, the second course is administered. If the response has been inadequate, laryngectomy may be performed with safety. This method has been a great help in certain difficult borderline cases and affords a chance of cure with preservation of the voice in the event that the lesion proves to be sensitive to radiation. It also does not eliminate the chances of cure by laryngectomy if the lesion proves to be radioresistant.

## American Review of Tuberculosis, New York

**49**:485-578 (June) 1944

Pulmonary Tuberculosis in Navy Recruits: Review of 50,100 Photofluorographic Chest Examinations. R. Shapiro.—p. 485.
Accidentally Discovered Pulmonary Tuberculosis. H. Abeles and M. Pinner.—p. 490.
Tuberculosis Among Hospital Personnel. W. G. Childress.—p. 501.
*Promin in Pulmonary Tuberculosis: Progress Report. R. J. Dancey, R. H. Schmidt Jr. and J. M. Wilkie.—p. 510.
Effects of $p_H$, Temperature and Salicylate on Bacteriostasis of Tubercle Bacilli by Sulfonamides and Diaminophenylsulfone. G. Middlebrook and J. B. Lloyd.—p. 535.
Bacteriostatic Activity of Some New Derivatives of Diaminodiphenylsulfone and Naphthoquinones Against Tubercle Bacillus. J. B. Lloyd and G. Middlebrook.—p. 539.
Chemotherapy of Benzophenone and Allied Compounds: II. Further Experiments on Tuberculostatic Action in Vitro. B. L. Freedlander.—p. 543.
Effect of Inorganic Iodides on Tubercles. W. P. Featherston.—p. 549.
Virulence of Tubercle Bacilli: In Vitro Method for Its Estimation. P. Schain.—p. 551.
Treatment of Severe Tuberculin Reactions. J. D. Pilcher.—p. 556.
Personal Problems in Treatment of Tuberculosis. Edith G. Seltzer.—p. 558.

**Promin in Pulmonary Tuberculosis.**—Promin, a highly water soluble member of a group of sulfones, has been used with success against guinea pig tuberculosis. In human pulmonary tuberculosis its ineffective use by the intravenous route has been reported by some investigators, while its beneficial effect by the oral route has been suggested by others. Dancey and others investigated the pharmacology of oral promin and its effect on the course of pulmonary tuberculosis in man. Promin was given by the oral route, occasionally supplemented

by parenteral administration, in a critical series of 16 patients with pulmonary tuberculosis. Cases selected were largely those presenting relatively recent exudative lesions in which the prognosis was poor under any form of treatment. The median average daily dose was 1.07 Gm., and the median length of treatment was five and one-half months. No other treatment except bed rest was employed. The degree and rapidity of improvement during promin therapy, as indicated by x-ray appearances, were greater than would have been anticipated in the same group of cases under rest treatment alone. In certain cases the course of the disease was abruptly reversed from progression to retrogression, but in a few instances the disease remained stationary or progressed during seemingly adequate promin treatment. Promin probably exerts a beneficial effect on human pulmonary tuberculosis when the lesions are of recent origin. Few observations have been made on chronic lesions, but it seems unlikely that they would be appreciably affected by promin. The curative action of promin in human pulmonary tuberculosis is not very potent, and promin alone should not be relied upon to effect an arrest. If these conclusions are borne out by further investigation, promin will have a place in the therapy of pulmonary tuberculosis but strictly as an adjunct to other modes of treatment. The potentially serious toxic effects of promin require that the use of the drug be adequately supervised. They also limit the therapeutic dosage. The high degree of solubility of promin facilitates its parenteral use and therefore appears to give promin a definite therapeutic advantage over relatively insoluble compounds in instances of temporary intolerance to oral medication.

### **50**:1-84 (July) 1944

Comparison of Roentgenograms with Pathology of Experimental Miliary Pulmonary Tuberculosis in Rabbit. E. M. Medlar, G. S. Pesquera and W. H. Ordway.—p. 1.
Patients Discharged Alive from County Sanatorium. D. R. Hastings and B. Behn.—p. 24.
Tuberculoma of Posterior Mediastinum. B. Blades and D. J. Dugan.—p. 41.
*Loeffler's Syndrome: Transient Pulmonary Infiltrations with Blood Eosinophilia. H. B. Pirkle and Julia R. Davin.—p. 48.
*Chemotherapy of Clinical Tuberculosis with Promin: P,P'-Diaminodiphenylsulfone-N,N'-Didextrose Sulfonate; Second Report of Progress. H. C. Hinshaw, K. H. Pfuetze and W. H. Feldman.—p. 52.
Cultivation of Bovine Tubercle Bacillus. A. R. Arena and A. Cetrangolo.—p. 58.
Cutaneous Activity of Old Tuberculins Prepared by Same and by Different Methods. R. Y. Gottschall, A. B. Mitchell and C. J. Stringer.—p. 68.
Further Observations on Production of Autolytic Tuberculin. H. J. Corper and M. L. Cohn.—p. 81.

**Transient Pulmonary Infiltrations with Blood Eosinophilia.**—Loeffler's syndrome, according to Pirkle and Davin, consists of asthma with cough, the occurrence of eosinophilia ranging from 10 to 60 per cent, the presence of a low grade fever accompanied by mild leukocytosis and an elevated sedimentation rate. X-ray examination reveals pulmonary infiltrations in various parts of the lungs, usually in the lower fields. They disappear rapidly and do not cavitate. Loeffler did not stress the possible allergic nature of the condition, but subsequent observers have suggested and sometimes demonstrated that the pulmonary infiltrations are on the basis of an allergy. The authors state that a woman aged 54 presented a history different from some of the other reported cases of Loeffler's syndrome in the absence of asthma and in the long duration of the pneumonic migrations. The pneumonitis continued to migrate for eight months. This woman is now employed as a nurse's aid. She continues to be nervous with easy fatigability and a tendency to tachycardia, but chest x-ray films taken at intervals of two months remain clear and there is no eosinophilia. The etiology of the syndrome remains obscure.

**Promin in Tuberculosis.**—Hinshaw and his co-workers presented in May 1942 a preliminary report on their experiences with promin (a diaminodiphenylsulfone derivative) with special reference to a group of 36 patients who had received supposedly adequate doses for from four to twelve months. The originally described clinical trends have been consistent and progressive on further observation. The results are sufficiently encouraging to justify controlled studies on a large series. Exudative lesions of recent origin appear to be more promising types for chemotherapy than those with caseation, necrosis, cavitation and fibrosis. The toxic manifestations of promin and related drugs are to be constantly reckoned with but are measurable, reversible and controllable and do not appear to have an adverse effect on the clinical course of tuberculosis. Anemia of considerable degree does not appear to hinder the healing process in tuberculosis. A few patients of this series made striking and consistent gains during a time when the hemoglobin content of their blood, as a result of chemotherapy, was constantly less than 10 Gm. per hundred cubic centimeters. The authors also direct attention to the use of promin in the treatment of human leprosy.

## Anesthesiology, New York

### **5**:329-440 (July) 1944

Studies on Barbiturates: XXVII. Tolerance and Cross Tolerance to Barbiturates. M. W. Green and T. Koppanyi.—p. 329.
Intraspinal Ammonium Salts for Intractable Pain of Malignancy. B. D. Judovich, W. Bates and K. Bishop.—p. 341.
Spinal Cord Level Syndrome Following Intrathecal Ammonium Sulfate and Procaine Hydrochloride: Case Report with Autopsy Findings. S. A. Guttman and I. Pardee.—p. 347.
Subarachnoid Ammonium Sulfate Therapy for Intractable Pain. L. V. Hand.—p. 354.
Inhalation Therapy: Method for Collection and Analysis of Statistics. M. Saklad, N. Gillespie and E. A. Rovenstine.—p. 359.
Clinical Use of [Sodium 5 Ethyl-5 (1-Methyl-1 Butenyl) Barbiturate] Vinbarbital Sodium as Preanesthetic Agent. P. H. Lorhan.—p. 370.
Effective Administration of Ether in Tropics. M. P. C. Storni and J. S. Lundy.—p. 380.
Respiratory Sequelae of Anesthesia in Military Practice. G. Kaye.—p. 383.
Nasoendotracheal Intubation: Advantages and Technic of "Blind Intubation." C. K. Elder.—p. 392.
Role of Anoxia in Gastrointestinal Effects of Anesthesia. E. J. Van Liere.—p. 400.

## Annals of Allergy, Minneapolis

### **2**:189-280 (May-June) 1944

*Allergy of Central Nervous System. T. W. Clarke.—p. 189.
Etiology of Seasonal Hay Fever in District of Columbia. G. T. Brown.—p. 197.
Presence of Thermostable Inhibiting Factor in Serums of Patients Treated for Hay Fever by Injections of Pollen Extract. E. A. Brown and E. M. Holden.—p. 207.
Sympathectomy as Aid in Relief of Familial Nonreaginic Food Allergy: Preliminary Report. A. F. Coca.—p. 213.
Protection of Asthmatic Patient Against Lung Irritants, with Special Reference to Chemical Agents Used in Warfare. K. J. Deissler.—p. 225.
Unusual Case of Sulfathiazole Sensitivity of Renal Type. J. Peters and A. J. Koven.—p. 230.
Importance of Vitamin C in Bodily Defenses: I. Antianaphylactic Effect of Vitamin C in Prevention of Pollen Reactions. L. Pelner.—p. 231.

**Allergy of Central Nervous System.**—Clarke believes that symptoms of increased intracranial pressure such as headache, vomiting, dizziness, pressure on the optic nerve, convulsions, hyperesthesia, anesthesia, paralysis and psychosis may occur as the result of an allergic shock. Many cases of migraine, of Ménière's disease and of infantile convulsions are of allergic origin. In 1922 Ward suggested that epilepsy is a manifestation of allergy. Clark examined a large number of epileptic patients from the point of view of allergy and concluded that in some there was an allergic etiology. Favorable results may be obtained if this is discovered early enough. He cites several examples and suggests that epilepsy is a manifestation of various conditions, one of which is allergy. It is improbable that an allergic study will relieve more than 10 per cent of the patients. The mental effects of allergy have received little study, though nervous symptoms are so common in association with the allergic diseases that until recently asthma, urticaria, angioneurotic edema and migraine were thought to be primarily diseases of the nervous system. It is a matter of common experience that the asthmatic child, though amenable normally, becomes irritable during an asthmatic seizure. Insomnia and excessive somnolence also have been overcome by correcting the diet of allergic patients. Though it has been demonstrated that allergic shock can cause mental depression, bewilderment and even active delirium, the psychiatrist has entirely overlooked the possibility of some of the recurrent types of psychoses having an allergic background. When patients with recurring psychoses give a family or personal history of allergic disease, they should be given a thorough investigation of their allergic idiosyncrasies and the appropriate treatment indicated thereby.

## Annals of Surgery, Philadelphia

**119**:801-968 (June) 1944

*Physiologic Analysis of Nature and of Treatment of Burns. W. W. L. Glenn.—p. 801.
*Nutritional Care of Cases of Extensive Burns, with Special Reference to Oral Use of Amino Acids (Amigen) in 3 Cases. Co Tui, A. M. Wright, J. H. Mulholland, I. Barcham and E. S. Breed.—p. 815.
Adenomatosis of Islet Cells, with Hyperinsulinism. Virginia Kneeland Frantz.—p. 824.
Pancreaticojejunostomy and Other Problems Associated with Surgical Management of Carcinoma Involving Head of Pancreas: Report of 5 Additional Cases of Radical Pancreaticoduodenectomy. C. G. Child. —p. 845.
Neurogenic Sarcoma of Jejunum Associated with von Recklinghausen's Disease. J. B. Hamilton, P. C. Kennedy and P. C. Herault.—p. 856.
Estimation and Significance of Blood Loss During Gastrointestinal Surgery. A. Oppenheim, G. T. Pack, J. C. Abels and C. P. Rhoads. —p. 865.
Enterogenous Cysts at Ileocecal Junction. S. A. Rosenburg.—p. 873.
Differential Diagnosis of Causes of Pain in Lower Back Accompanied by Sciatic Pain. P. B. Magnuson.—p. 878.
Anatomic Study of Lumbosacral Region in Relation to Low Back Pain and Sciatica. W. A. Larmon.—p. 892.
Chronic Spinal Epidural Granuloma: Report of 2 Cases. M. O. Grossman, B. H. Kesert and H. C. Voris.—p. 897.
Venography: Its Value in Diagnosis and Management of Venous Disturbances of Lower Extremities. A. Lesser and G. Danelius.—p. 903.
Pectus Excavatum: Report of 2 Cases Successfully Operated on. R. H. Sweet.—p. 922.
Brachial Plexus Block Anesthesia: Improved Technic. D. R. Murphey Jr.—p. 935.
Basal Cell Lesions of Nose, Cheek and Lips. W. B. Davis.—p. 944.
Effect of Locally Implanted Sulfonamides on Wound Healing. H. A. Zintel.—p. 949.
Anesthetic Deaths in 54,128 Consecutive Cases. J. C. Trent and Ellen Gaster.—p. 954.

**Physiologic Analysis of Nature and Treatment of Burns.**—Glenn discusses the use of closed plaster dressings in burns. There is no local harm from this treatment. There were no instances of injured circulation. The prompt return of function of a part immobilized in plaster over prolonged periods has been one of the most gratifying features. The treatment is comfortable. The plaster dressing is easy to apply to burns of the extremity. The slight after-care is one of the chief advantages. Pain or discomfort in an encased extremity occurring twenty-four to thirty-six hours after application of the dressing was relieved by elevation of the part. After minimal cleaning and débridement and without breaking blisters, two layers of sterile gauze are laid over the burned surface extending above the area to be covered by plaster. If fingers are involved they are enclosed separately in the gauze. A thin sheet of roller plaster bandage is then applied to the part without pressure, extending over the end of the extremity and 2 to 4 inches above the burn. In mild burns the encasement is removed in seven to fourteen days. In more severe burns it may be left in place for as long as four weeks.

**Nutritional Care in Extensive Burns.**—Co Tui and his collaborators deal with the nutritional care of 3 cases of thermal third degree burns of, respectively, 10, 30 and 50 per cent of the body surface. The patients were given high caloric and high nitrogen feedings in the form of dextrimaltose and amigen. The nitrogen balance was followed throughout convalescence and the plasma proteins and body weight were determined periodically. All 3 patients were maintained in an excellent nutritional state. There seemed to be a mathematical relationship between the extent of surface burned and the amount of nitrogen required to maintain nutrition. Transfusions were reduced to a minimum. Preparations such as amigen seem to be better tolerated and utilized than natural protein food and appear to be the solution to the problem of nutritional care of severe cases of protein drain. The development of shock following immediately on the first skin grafting is a phenomenon which may have an important bearing on the safety of this procedure in extensive burns. Theoretically it is to be expected that in patients undergoing severe protein loss with protein synthesis barely keeping up with the loss the opening up of new areas of the skin surface, with resulting increase in exudation and bleeding, would readily lead to the development of shock. If this explanation is correct, patients in this condition should have no skin grafting attempted unless the protein nutrition has been improved and measures for the therapy of shock are at hand.

## Archives of Ophthalmology, Chicago

**31**:453-584 (June) 1944

Evaluation of Ocular Angiospasm. S. R. Gifford.—p. 453.
Dickey Operation for Ptosis: Results in 21 Patients and Thirty Lids. F. C. Cordes and U. Fritschi.—p. 461.
Role of Sarcoidosis and of Brucellosis in Uveitis. A. C. Woods and J. S. Guyton.—p. 469.
Development of Anterior Peripheral Synechiae in Experimental Acute Glaucoma. M. U. Troncoso.—p. 481.
Appraisal of Value of Orthoptic Clinic in Private Practice. E. C. Ellett, R. O. Rychener and J. S. Robinson.—p. 503.
Drusen of Optic Nerve Simulating Cerebral Tumor.—N. S. Schlezinger, J. Waldman and B. J. Alpers.—p. 509.
Uveitis Associated with Hodgkin's Disease: Report of Case. S. Kamellin.—p. 517.
Uveitis; Dysacousia; Alopecia; Poliosis and Vitiligo: Theory as to Cause. E. B. Hague.—p. 520.
*Autoinoculation of Eyelids with Vaccinia. W. R. Klunzinger.—p. 539.

**Autoinoculation of Eyelids with Vaccinia.**—Klunzinger reports the case of a boy aged 8 who developed redness and swelling of the lids of both eyes three days after he had been vaccinated on the right arm. Examination a week after vaccination revealed severe redness of both eyes, swelling and induration, with several ulcerations along the margins, and moderate mucopurulent discharge. There was a nontender swelling from eye to ear bilaterally. A tentative diagnosis of vaccinia reaction was made. Irrigations of boric acid were made every hour during the day, together with application of hot compresses for twenty minutes three times a day. Under this treatment there was decided improvement in five days. The patient was discharged, with instructions to use hot compresses three times a day followed by instillation of aqueous solution of metaphen (1:2,500). Sulfadiazine was used for a short time, since the diagnosis was at first questionable. Its use was discontinued after examination of smears revealed no causative organisms, and its effect was probably only to reduce the febrile reaction. Although ocular complications after vaccination are uncommon, the possibility of their occurrence should be remembered. Lesions of the lids and conjunctiva have been found to run a self-limited course, healing in seven to ten days with no sequelae. Corneal involvement, however, requires a much longer period for healing, and visual impairment often results. It is of the utmost importance to prevent corneal involvement.

## Archives of Pathology, Chicago

**37**:351-414 (June) 1944

Adrenal Medulla in Various Diseases: Histophysiologic Study. R. L. Drake, J. S. Hibbard and C. A. Hellwig.—p. 351.
Encephalitis Complicating Virus Pneumonia: Report of Case with Autopsy. Helen Ingleby.—p. 359.
Anomalous Pulmonary Veins. C. W. Hughes and P. C. Rumore.—p. 364.
Primary Neoplasms of Liver. W. N. Warvi.—p. 367.
Feather Germ Reaction to Urine from Patients with Cancer and Other Conditions: Preliminary Study. Mary Juhn.—p. 383.
Origins of Cell Concept in Pathology. H. G. Schlumberger.—p. 396.

## Archives of Surgery, Chicago

**48**:423-498 (June) 1944

*Syphilis of Tendon of Long Head of Biceps Muscle and of Olecranon Bursa. V. L. Schrager.—p. 423.
Tuberculous Abscess of Thyroid Gland: Report of Case and Review of Literature. R. W. Postlethwait and P. Berg Jr.—p. 429.
*Role of Allergy in Delayed Healing and Disruption of Wounds: I. Antigenicity of Catgut. H. C. Hopps.—p. 438.
*Id.: II. Effect of Specific Sensitivity to Catgut on Reaction of Tissues to Catgut Sutures and of Healing of Wounds in Presence of Catgut Sutures. H. C. Hopps.—p. 445.
*Id.: III. Delayed Healing and Disruption Produced by Local Allergic Reaction (Auer Phenomenon). H. C. Hopps.—p. 450.
Progressive Gangrene in Operative Wound. D. W. Leonard.—p. 457.
Regional Enteritis: Pathologic Study of 22 Cases. F. M. Owens Jr. —p. 465.
Results of Long Term Experimental Constriction of Hepatic Veins in Dogs. C. D. Armstrong and V. Richards.—p. 472.
Chemosurgical Treatment of Cancer of Lip: Microscopically Controlled Method of Excision. F. E. Mohs.—p. 478.
Effects of Continuous and of Intermittent Application of Tourniquet to Traumatized Extremity. A. Blalock.—p. 489.
Effect of Hypoproteinemia on Susceptibility to Shock Resulting from Hemorrhage. I. S. Ravdin, H. G. McNamee, J. H. Kamholz and J. E. Rhoads.—p. 491.

**Syphilis of Tendon of Biceps and of Olecranon Bursa.**—Schrager's patient, aged 61, gave a long history of pain in different joints which had been diagnosed repeatedly as rheumatism and arthritis. A 4 plus Wassermann reaction years before led to treatment with neoarsphenamine and bismuth compounds

but the treatment was discontinued when jaundice developed. The patient presented a tumor mass in the upper part of the arm. Operation revealed a tumor mass in the tendon sheath of the long head of the biceps muscle. It was removed together with a few strips of tendon and its sheath, which were red and frayed. An olecranon bursa the size of a large walnut was present over the right elbow. It had a thick capsule. The contents of the bursa were exactly like those found in the tendon sheath of the biceps muscle. Both wounds healed by primary intention. Microscopic examination of the tumor mass revealed changes compatible with a syphilitic granuloma, and the olecranon bursa showed a picture characteristic of a syphilitic gumma. Spirochetes were found in the granulation tissue. The author thinks that syphilis of tendons and bursas should be suspected more often in the diagnosis of tendinitis and bursitis.

**Antigenicity of Catgut.**—Hopps attempted to determine whether or not a state of hypersensitivity to catgut can be induced. It was considered that catgut per se, because of the probable denaturation of protein and the chemical alteration sustained during preparation and because of its relative insolubility, is a poor antigen. Sheep serum or sheep intestine might be more effective in stimulating the formation of antibodies to catgut than catgut itself. For these reasons the following materials were used as antigens: (1) plain surgical catgut, (2) sheep intestine, (3) sheep serum. The author produced hypersensitivity to catgut in rabbits and guinea pigs, as shown by positive cutaneous reactions, positive reactions to catgut implanted in the anterior chamber of the eye and demonstration of humoral antibodies (precipitins, agglutinins, complement fixing antibodies and anaphylactins) in vivo and in vitro. Catgut, sheep intestine or sheep serum is capable of inducing this hypersensitive state. In addition to antibodies which will react with either catgut or sheep serum, catgut stimulates the production of antibodies specific for itself. These antibodies specific for catgut may also be specific for collagen or for mucoprotein. Heterophile antibodies do not react with catgut.

**Effect of Sensitivity to Catgut on Reaction of Tissues to Catgut Sutures.**—These experiments were designed to evaluate the effects of hypersensitivity to catgut on the reaction of tissues to catgut sutures and on the healing of surgical wounds repaired with catgut. Hopps observed evidence of slightly heightened reaction of the tissues to catgut sutures in animals which were hypersensitive to catgut. There was, however, no appreciable difference between normal rabbits and rabbits sensitized to catgut in the rate of dissolution or digestion of catgut sutures during the critical period of healing of wounds. There was no significant difference between normal rabbits and rabbits sensitized to catgut in the healing of laparotomy wounds repaired with catgut sutures. The absence of significant allergic reaction to catgut in the wounds of animals sensitized to catgut is attributed to the relative insolubility of catgut sutures.

**Delayed Healing and Disruption Produced by Local Allergic Reaction.**—Hopps directs attention to Auer's phenomenon of "local autoinoculation of the sensitized organism with foreign protein." It is generally accepted that disruption of the wound is more prone to occur when an abdominal operation is performed in the presence of preexisting infection, such as pelvic abscess or peritonitis. Although this increased incidence of breakdown of the wound may be in response to direct infection of the wound, the possibility of yet another mechanism appears. In the presence of a well localized infection the patient may be assumed to have a rather high degree of immunity or sensitivity to the specific infectious agent and a high humoral antibody titer. As the result of operative manipulation of such a localized infectious lesion an appreciable amount of dead or living bacteria and their products may be forced through the protective barrier of granulation tissue to enter the general circulation. Under these conditions all of the necessary requirements for the development of an Auer reaction would be fulfilled: (1) the surgical wound, providing a localizing lesion; (2) the chronic infection, stimulating a high humoral and tissue antibody titer, and (3) manipulation of the localized infectious process, allowing for the introduction of specific antigen into the blood stream. Experiments demonstrated that the healing of laparotomy wounds is profoundly altered in rabbits previously sensitized in which specific antigen is reinjected postoperatively. The most obvious explanation is that a local anaphylactic reaction plays a predominant part. Other possibilities to be considered are a direct or indirect effect of general anaphylaxis and local formation of antibodies. The author concludes that local allergic reaction at the site of a surgical wound will delay healing and encourage disruption. The mechanism of such delayed healing appears to rest in a failure of the maturation of macrophages, with resultant failure in the production of the reticulum and collagen.

## California and Western Medicine, San Francisco

**60**:273-356 (June) 1944

Aviation Medicine in Peace and War. C. R. Glenn.—p. 278.
Venereal Disease Control in Military Scene. J. R. Scholtz.—p. 283.
Placenta Previa. P. H. Arnot.—p. 287.
Psychoses Following Prostatic Surgery. A. G. Folte.—p. 289.

**61**:1-48 (July) 1944

Public Relations Survey of California. J. R. Little.—p. 10.
*Carbon Tetrachloride Poisoning: Report of Cases. B. E. Konwaler and C. B. Noyes Jr.—p. 16.
Public Health: Medical Specialty. W. L. Halverson.—p. 21.
Leukemia as Cause of Nasal Obstruction: Report of Case. F. N. Hatch.—p. 23.

**Carbon Tetrachloride Poisoning.**—Konwaler and Noyes add 3 more cases of poisoning from carbon tetrachloride to those reported by others. The 3 men drank heavily over the weekend and reported for duty Monday morning with "hang overs." They worked from 8:30 a. m. to 11:30 a. m. in a poorly ventilated compartment. Three other men, who had not been drinking liquor recently, were also working in the same compartment. The men were cleaning machinery with rags soaked in carbon tetrachloride. They had volatilized approximately 1½ quarts of the liquid in three hours when they noticed that the smell of the vapor became quite heavy. Only 1 of the men developed symptoms during the period of exposure. One patient, who later died, first felt sick at 10 a. m. The second victim felt well until 6:30 that evening. The third man had left the compartment frequently and had been exposed much less than the first two. He showed no symptoms of poisoning until the following morning. The three nonalcoholic workers developed no symptoms and continued at their duty. The 3 cases illustrate three grades of severity of carbon tetrachloride intoxication. Carbon tetrachloride is a potent renal poison, resulting in severe cases in acute toxic nephrosis with uremia. Hepatitis is also found but is not severe. Alcohol ingestion prior to exposure assumes a synergistic role.

## Canadian Medical Association Journal, Montreal

**51**:1-98 (July) 1944

Problems of Future for Organized Medicine. D. S. Lewis.—p. 1.
Factors Influencing Rate of Flow of Intravenous Infusions. H. E. Pugsley and R. F. Farquharson.—p. 5.
Studies on Increased Coagulability of Blood. T. R. Waugh and D. W. Ruddick.—p. 11.
*Simple Office Test for Uterine Cancer Diagnosis. J. E. Ayre.—p. 17.
Generalized Granulomatous Reaction Following Sulfonamide Therapy. W. S. Hartroft.—p. 23.
Drug Eruptions, with Special Reference to Sulfa Drugs. J. F. Burgess.—p. 25.
Thiouracil in Treatment of Thyrotoxicosis. E. M. Watson and L. D. Wilcox.—p. 29.
Thiouracil and Its Effects on Hyperthyroidism. J. K. McGregor.—p. 37.
Thiouracil in Treatment of Hyperthyroidism. Elizabeth M. Martin.—p. 39.
Fractures of Femur in Canadian Army in England. A. D. McLachlin and J. A. MacFarlane.—p. 41.
Incidence of Pulmonary Tuberculosis in Royal Canadian Naval Service. C. B. Peirce, G. Jarry and A. C. Richardson.—p. 46.
Septate Vagina Complicated by Pregnancy. N. H. Olesker.—p. 51.

**Simple Office Test for Uterine Cancer Diagnosis.**—Ayre points out that in many cases intensive study of several smears is required to arrive at a correct diagnosis when the smears are taken directly from the vagina. He suggests a modification which consists in taking a smear directly from the external os of the cervix. Here the concentration of cancer cells is greater. In Ayre's series of cases, smears from the vagina were compared with smears from the external os, and in both cervical and fundal carcinoma a much greater concentration of cancer cells was consistently present in smears from the cervix. The vaginal smear test for cancer may be con-

sidered a surface biopsy of the cells and cell clumps being shed by the genital tract. The finding of cancer cells in these secretions would appear to be strong presumptive evidence of cancer. The mere finding of the cells does not always point to the origin of the growth. Since malignant growths of the genital tract are chiefly cervical or fundal, these sites should be the first to be subjected to biopsy. Diagnosis of cancer cells in smears should be confirmed by biopsy before operation or radiotherapy. At the author's clinic 40 cases of uterine cancer were proved by biopsy, and of these 38 showed cancer cells in the smear.

## Hawaii Medical Journal, Honolulu

**3**:213-260 (May-June) 1944

*Weil's Disease: Report of 37 Cases. H. M. Patterson.—p. 213.
Bacillary Dysentery, with Special Reference to Epidemic on Maui. W. B. Patterson.—p. 222.

**Weil's Disease.**—Patterson reports observations on 37 cases treated by him at Olaa Hospital between October 1941 and November 1943. In the Olaa area of Hawaii this disease is essentially an occupational one, occurring principally in young cane cutters. The first symptom in half of the patients was headache. All the patients had loss of appetite and generalized malaise, with 50 per cent having more pain in the calf muscles than elsewhere. Nineteen patients had chills and 13 vomited before admission. All patients had eye symptoms such as conjunctivitis and scleritis, which is the most important manifestation in this disease. All patients were listless and 36 had muscle weakness. Jaundice was present on admission in only 7 patients and developed later in only 9 others. Weight loss averaged 11⅗ pounds. The average peak temperature was 102.8 F. Twenty-nine patients showed albumin in the urine, 18 showed cells of some kind in the urine and only 1 showed casts. Repeated blood serum agglutination tests are the most reliable laboratory procedure. All patients had positive blood serum agglutinations for Leptospira icterohemorrhagiae in dilutions of 1:300 or more. The treatment of choice is whole blood transfusions from convalescent patients. Otherwise the treatment is largely symptomatic. Sulfathiazole and sulfadiazine seem ineffective. The medical profession and industry in the territory should cooperate in the development of a vaccine to be used in the immunization of field workers, and possibly the entire population, against Weil's disease.

## Journal of Clin. Endocrinology, Springfield, Ill.

**4**:179-228 (May) 1944

*Thiourea and Thiouracil in Treatment of Thyrotoxicosis. K. E. Paschkis, A. Cantarow, A. E. Rakoff, A. A. Walkling and W. J. Tourish.—p. 179.
Precocious Sexual and Somatic Development in Male Infant with Pre-Sacral Teratoma Containing Androgen Producing Tissue, with Discussion of Mechanism of Precocity Caused by Teratomas. A. E. Rhoden.—p. 185.
Insulin Requirement of Man After Total Pancreatectomy. M. G. Goldner and D. E. Clark.—p. 194.
Effects of Testosterone and of Testosterone Propionate on Protein Formation in Man. J. C. Abels, N. F. Young and H. C. Taylor Jr.—p. 198.
Excretion of Sodium Pregnandiol Glucuronidate in Urine Following Oral Administration of Anhydrohydroxyprogesterone and Progesterone to Patients with Secondary Amenorrhea. W. M. Allen, Ellenmae Viergiver and S. D. Soule.—p. 202.
Optimal Requirements for Adrenal Cortical Hormones as Observed in Adrenalectomized Animals: Brief Review. D. J. Ingle.—p. 208.
Some Recent Advances in Experimental Endocrinology. E. W. Dempsey.—p. 211.

**Thiourea in Thyrotoxicosis.**—Paschkis and his associates report their experience with the use of thiourea and thiouracil in 21 cases of thyrotoxicosis. They found that thyrotoxicosis can be suppressed with either drug. Thiourea proved to be more toxic and was discontinued as soon as thiouracil became available. Toxic manifestations from thiouracil, consisting of cutaneous eruption, fever, arthralgia, leukopenia and jaundice, were observed in 3 cases. Improvement was usually noticeable after from four to six days of treatment, with complete suppression of thyrotoxic manifestations after two to three weeks. In most cases 1 Gm. of thiouracil was effective, but in 3 instances no response was achieved with 1 Gm. and full effect required 2 Gm. Thiouracil was used for preoperative treatment in 3 cases, the preoperative and postoperative course being satisfactory in 2 and death in thyroid crisis occurring in the third, in which iodine also had been administered preoperatively. The drug proved particularly valuable in cases in which operation was deemed inadvisable. An attempt was made to establish a permanent maintenance dosage level rather than to employ intermittent treatment. After full effect was achieved, doses as small as 0.1 to 0.2 Gm. daily proved satisfactory. Evidences of myxedema developed in 2 cases and subsided after the drug was temporarily discontinued.

## Journal of Nat. Cancer Inst., Washington, D. C.

**4**:539-600 (June) 1944

Production of Malignancy in Vitro: VIII: Observations on Mitochondria and Golgi Material. A. J. Dalton and W. R. Earle, with the technical assistance of E. L. Schilling, Virginia B. Peters and Emma Shelton.—p. 539.
Ciliated Cells of Thyroid of Mouse. Thelma B. Dunn.—p. 555.
Growth Rate and Development of Tumors Induced with Ultraviolet Radiation. H. F. Blum.—p. 559.
Review of Serodiagnostic Tests for Cancer. Mary E. Maver.—p. 571.
Influence of Environment on Mammary Cancer in Mice. H. B. Andervont.—p. 579.
Effect of Two Azo Compounds When Added to Diet of Mice. H. B. Andervont, J. White and J. E. Edwards.—p. 583.
Administration of 3,5-Cholestadiene and Dicholesteryl Ether to Mice and Rats. C. D. Larsen and M. K. Barrett.—p. 587.
Test of Desoxycholic Acid for Carcinogenicity in Rats and Mice. M. K. Barrett and C. D. Larsen.—p. 595.

## Journal of Nervous and Mental Disease, New York

**100**:1-114 (July) 1944

Immediate Circulatory and Respiratory Effects of Convulsive Shock: (Curare Protected Metrazol and Electric Shock). L. F. Woolley.—p. 1.
Central Nervous System in Diphtheria. A. B. Baker and H. H. Noran.—p. 24.
Relationship of Concept Formation Test to Drug Addiction and to Intelligence. C. K. Aldrich.—p. 30.
Unusual Types of Anosognosia and Their Relation to Body Image. N. Roth.—p. 35.
The Absolute and the Unconscious: Freud and America. W. Eliasberg.—p. 44.
Psychiatric Adventure in Comparative Pathophysiology of Infant and Adult, with Some Theoretical Suggestions in Regard to Regression in Somatic Visceral Functions. J. J. Michaels.—p. 49.
Psychomotility in Behavior Disorders as Seen in Handwriting of Children. Selina Schryver.—p. 64.
Prevention of Fatality and Fracture During Electric Coma Therapy. H. F. Darling.—p. 70.

## Michigan State Medical Society Journal, Lansing

**43**:483-526 (June) 1944

Problem of the Mild Psychoneurotic in Army. W. B. Martin and P. A. Petree.—p. 483.
Postpartum Sterilization. E. A. Schumann.—p. 488.
Edema in Children. I. McQuarrie.—p. 492.
Office Treatment of Rectal Disease. A. E. Souda.—p. 501.

**43**:527-626 (July) 1944

Newer Trends in Industrial Sanitation. M. H. Solworth.—p. 558.
Psychiatric Approach to Current Mental Health Problems in Industry. L. E. Himler.—p. 564.
Prevention of Epidemics of Dermatitis in Industry Including Dermatophytosis. S. M. Peck.—p. 568.
Criteria for Employability of Individuals with Lung Pathology. C. F. Long.—p. 574.
Reconditioning Problems for Disabled Veterans. M. W. Jocz and J. J. Prendergast.—p. 577.
Ocular Pathology Due to Organic Compounds. M. H. Pike.—p. 581.
Penicillin in Surgery. J. W. Hirshfeld.—p. 584.

## Northwest Medicine, Seattle

**43**:185-218 (July) 1944

Penicillin and Its Therapeutic Uses. F. B. Queen.—p. 188.
Varicose Veins of Lower Extremity. M. S. Rosenblatt.—p. 195.
Parathyroid Extract in Preeclamptic Toxemia. J. C. Brougher.—p. 198.
Staphylococcic Septicemia Following Uncomplicated Upper Respiratory Infection: Reported Case with Recovery. M. Scarf, S. Rosenthal and H. H. Marquis.—p. 201.
*Ménière's Syndrome, with Results of Treatment with Histamine. S. E. C. Turvey.—p. 203.

**Histamine for Ménière's Syndrome.**—Turvey reviews the results of treatment with histamine in 36 cases of Ménière's disease. Four of the patients had meningovascular neurosyphilis and received no other treatment except malaria and chemotherapy. They made an excellent recovery. Sixteen have been treated by histamine intravenously with subsequent subcutaneous injections of histamine, phenobarbital orally and occasionally ammonium chloride. Of these 6 have had no attacks of vertigo

for periods varying from one to three years, 5 are improved and 5 are unimproved. Of the remaining 16 patients who were treated with the Furstenburg regimen, consisting of a low sodium chloride diet and ammonium or potassium chloride orally as well as phenobarbital, 3 have been cured for periods varying from one to five years, 4 are improved and 9 are unimproved. Histamine is not a specific and is only a useful adjunct in therapy which frequently fails. Surgery should always be a last resort to be delayed as long as possible.

## Union Médicale du Canada, Montreal

**73**:617-752 (June) 1944

Tumors of Fourth Ventricle or of Median Line. R. Amyot.—p. 621.
Disturbances During Intermenstrual Period. F. B. Kozlowski.—p. 631.
*Pathologic Relations of Beriberi and Poliomyelitis. W. J. McCormick. —p. 638.
Importance of Direct Test in Determination of Compatibility of Blood in Transfusion. A. Bertrand.—p. 646.
*Paroxysmal Tachycardia of 350 Pulsations per Minute in Nursling. N. Vezina.—p. 648.
Lymphangioma of Mesentery. E. Cabana and L. Mainville.—p. 655.
Solitary Diverticulum of Cecum. G. D'Argencourt.—p. 660.
Hemophylia and Articular Manifestations. L. Morrissette.—p. 662.
Pyridoxine (Vitamin $B_6$) and Radiation Sickness. J. E. Gendreau and L. Lafleur.—p. 666.
Epidemic Pemphigus of the Newborn: Prophylaxis and Treatment. H. Smith.—p. 671.

**Relationship of Beriberi and Poliomyelitis.**—McCormick made comparisons between beriberi and poliomyelitis during the Toronto poliomyelitis epidemic of 1937 and has arrived at the hypothesis that poliomyelitis can depend largely on a B avitaminosis. The modern conception of the virus of poliomyelitis, which makes of it a chemical substance of known molecular size rather than a living organism, demands a revision of the interpretation of the experiences of Flexner regarding the specificity and transmissibility of the disease. It would then be necessary to envisage the possibility of the endogenic origin of the virus. The paralysis of poliomyelitis could depend directly on a severe deficiency in vitamin $B_1$, which in turn would depend on certain factors of activation of the general metabolism and the augmentation of the organism's need for the vitamin. These factors will include febrile conditions, age, sex, atmospheric conditions and physical overexertion at play, work or pregnancy. Thus, poliomyelitis becomes a clinical form of avitaminosis rather than a specific autonomic disease. The virus becomes a biochemical product of the pathologic process itself and, although it may be capable by catalytic action on the nervous system to reproduce paralysis in the laboratory animal, it must not inevitably be considered as a transmitting agent of the disease in ordinary circumstances. It is possible that a substance identical with the virus can be obtained from the nervous system of patients with beriberi. The term poliomyelopathy expresses the nature of the disease better than poliomyelitis.

**Paroxysmal Tachycardia in Infant.**—Vezina describes 3 successive attacks of paroxysmal tachycardia in an infant. The first attack occurred when the infant was 6 weeks old after having been in his perambulator for three hours under a hot July sun. When taken from his perambulator the child was extremely pale and had a rapid respiration. Heat stroke was thought of, but when severe symptoms persisted the child was hospitalized and a diagnosis of paroxysmal tachycardia was made and medication with digitalin was begun at once. At the end of fourteen days the child was discharged from the hospital apparently entirely well. About two months later the child was hospitalized again. At this time the heart action was so rapid that the beats could not be counted on auscultation. Electrocardiography revealed a sinusal tachycardia of from 330 to 350 beats a minute. At the age of 7 months the child had a third attack. During the second and third attacks digitalin was given again, but, while the fortunate development during the first attack must be attributed to oral medication with digitalin, this effect of digitalin was less evident during the second and third attacks. It was impossible to determine the cause of this paroxysmal tachycardia. It is characterized by the sudden appearance of polypnea accompanied by cyanosis. Hepatomegaly is pathognomonic. The author is convinced that paroxysmal tachycardia will be discovered more often in infants if electrocardiography is used more often in pediatrics.

## Yale Journal of Biology and Medicine, New Haven

**16**:395-612 (May) 1944. **Partial Index**

Comments on Immunity to Virus Diseases. T. Francis Jr.—p. 401.
Use of Immune Bodies in Treatment of Certain Infectious Diseases (Virus and Rickettsial Diseases) Caused by Intracellular Parasites. J. Stokes Jr.—p. 415.
Protective or Curative Element in Type B Haemophilus Influenzae Rabbit Serum. H. E. Alexander, M. Heidelberger and Grace Leidy. —p. 425.
*Use of Sulfaguanidine for Prophylaxis in Sonne Bacillary Dysentery, and in Control of Carrier State. H. Yannet, Joyce V. Deutsch and Rose Lieberman.—p. 443.
*Presence of Poliomyelitis Virus in Human Cases and Carriers During Winter. R. Ward and A. B. Sabin.—p. 451.
Susceptibility of East African Monkeys to Experimental Poliomyelitis. J. R. Paul.—p. 461.
Observations Concerning Pathogenesis and Epidemiology of Mouse Poliomyelitis. S. Gard.—p. 467.
Vitamin $B_1$ Deficient Animals and Poliomyelitis. J. A. Toomey, W. O. Frohring and W. S. Takacs.—p. 477.
Rocky Mountain Spotted Fever in Children. J. V. Cooke.—p. 495.
Cardiac Hypertrophy in Newborn Infants. H. C. Miller.—p. 509.
Note on Agglutination of Meningococcus. C. P. Miller.—p. 519.
Filariasis Among American Troops in South Pacific Island Group. R. W. Huntington Jr., R. H. Fogel, S. Eichold and J. G. Dickson.—p. 529.
Relation of Insulin to Phosphate Metabolism. W. C. Stadie.—p. 539.
Renal Disease Consequent on Intravenous Injection of Low Viscosity Methyl Cellulose. R. Katzenstein, M. C. Winternitz and J. Meneely. —p. 571.
Congenital Adrenal Cortical Insufficiency with Virilism: Case Report. D. C. Darrow.—p. 579.
Fatal Case of Rat Bite Fever Due to Streptobacillus Moniliformis. F. G. Blake, Dorothy M. Horstmann and Hildegarde Arnold.—p. 589.
Eczema and Hemolytic Streptococcal Disease in Children. P. L. Boisvert and G. F. Powers.—p. 595.

**Sulfaguanidine for Prophylaxis of Sonne Dysentery.**—Yannet and his collaborators showed the effectiveness of sulfathiazole in a previous outbreak of Sonne dysentery in a home for mental defectives. However, the sulfonamide did not curtail the period during which the organism could be recovered by rectal culture. On the contrary, there was evidence that this period was prolonged when compared with untreated controls. It was hoped that the administration of a poorly absorbed drug, such as sulfaguanidine, might correct this defect. A renewed outbreak of Sonne dysentery two years later (1943) gave the authors an opportunity to test the value of sulfaguanidine for reducing the length of the carrier state. The cases of bacillary dysentery were confined to four cottages housing from 40 to 70 inmates each. A total of 29 cases occurred, representing from 10 to 20 per cent of the inmates of the respective cottages involved. The Sonne organism was isolated in every case of acute dysentery. The 29 cases were divided into two groups, one consisting of 18 cases in which sulfaguanidine was administered for seven days; in the remaining 11 cases, the drug was administered for fourteen days. The number of days before the first of the consistently negative cultures was obtained is not significantly different from that in the group in which no specific drug therapy was given. It is felt that the dose used, roughly one fourth of that recommended for therapeutic purposes, might have been inadequate. In two of the cottages it was possible to carry out controlled experiments on the possible prevention of bacillary dysentery by means of sulfaguanidine.

**Presence of Poliomyelitis Virus During Winter.**—Ward and Sabin report the recovery of poliomyelitis virus in January and February 1942 from the intestinal discharges of 2 poliomyelitis patients, 1 paralytic and the other nonparalytic, and from those of a healthy sibling of each patient who lived on the outskirts of Cincinnati. This isolation of the virus in the winter establishes the occurrence of the disease at that season. This finding has been confirmed by the recovery of virus in February 1942 from the stool of a paralytic patient in Bridgeport, Conn. The epidemiologic implications which suggest themselves are that: 1. Poliomyelitis may occur throughout the year, but its greater incidence during the summer and fall months may be related to opportunities for wider dissemination of virus. 2. It would seem possible that poliomyelitis, like typhoid and dysentery, may be transmitted by any of the several methods whereby infective particles derived from human excrement find their way to the susceptible human host. 3. The patient and the healthy carrier may constitute reservoirs of virus during interepidemic months.

## FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Medical Journal, London

**1**:739-136 (June 3) 1944

Some Problems of Infective Hepatitis. L. J. Witts.—p. 739.
With Eighth Army in Field. C. Donald.—p. 743.
*Some Dangers of Sulfonamides in Ear Infections. A. R. Dingley.—p. 747.
Bone Marrow Transfusion in Infants and Children: Introducing a Specially Designed Needle. Janet D. Gimson.—p. 748.
"Cellophane" for Treatment of Burns. J. Farr.—p. 749.
Symptomless Enlargement of Esophagus. J. L. D'Silva.—p. 751.

**Dangers of Sulfonamides in Ear Infections.**—Dingley advances the following suggestions for guidance in treatment of otitic infections: Sulfonamides will never take the place of necessary surgical drainage. Treatment of acute suppurative otitis media by a sulfonamide should be reserved for the period after incision of the membrane and bacteriologic investigation. If the fever is maintained, the appropriate sulfonamide may be used in full dosage (day and night) but not after the end of the second week. After two, three or four weeks the condition of the ear, if still actively suppurating, is again becoming one that potentially requires surgical drainage, this time of the mastoid; and signs and symptoms justifying intervention must not be masked by the administration of sulfonamides, which at best will rarely reach the local area but will distort the clinical picture as a whole. Wholesale use of sulfonamides in otitic infections is to be deprecated. If a sulfonamide has been given before drainage, the most valuable help in assessing the beneficial effect of the drug is gained by examining the drum head frequently. If this continues to bulge, myringotomy should not be delayed; for the condition, which otherwise appears to be improving, is in reality becoming more perilous. Persistence of deafness is also a strong indication that all is not well. Patients taking sulfonamide drugs sometimes do not acquire any resistance of their own to the infection with which they are contending, and it would seem that recurrences are more likely in these cases, which, in addition to developing no immunity to the infection, may find that the micro-organism has become sulfonamide resistant. It is needless to emphasize the uselessness and danger of giving inadequate or erratic dosage of sulfonamides.

**"Cellophane" for Treatment of Burns.**—Farr directs attention to the "cleansing, rest and compression" treatment of burns advocated by Allen and Koch and by Siler. He describes a modification of this method, which consists in an occlusive dressing medicated with sulfanilamide through which the burned area may be easily inspected. This is achieved by the use of "cellophane" and sulfanilamide ointment. Using general anesthesia, the intact skin surrounding the burned area is thoroughly cleaned with white soap and water, and then the toilet of the burned area is carried out with isotonic solution of sodium chloride. The medicated sheets of cellophane are then applied so that each overlaps the other for about an inch. These sheets adhere to one another and to the intact skin, and the entire burn is embraced in an envelop that permits of easy inspection and prevents contamination. Next, perforated oiled silk is wrapped around the cellophane to prevent the wool from adhering to the dressing. After forty-eight hours the burn is inspected. The cellophane may be blistered by collections of serum. Any such bullae are trimmed away with scissors and the area affected gently cleaned with saline swabs and another sheet of cellophane applied. This transparent dressing adheres lightly to healed burned areas but if carefully removed does not damage the delicate new epithelium. The cellophane does not adhere to the unhealed areas, so that damage to the tissue, if the dressing must be changed, is minimal. The cellophane sheets may be medicated, sterilized, and stored for immediate use when needed. It is suggested that the application of a powdered sulfonamide to the burn or wound, followed by the immediate application of cellophane sterilized by boiling, offers many advantages as a first aid measure. It permits of easy and painless inspection of the burn when the ultimate treatment has to be decided and does not prejudice the form of treatment to be adopted. It would prevent contamination and be bacteriostatic to infection already present in the burn.

### Journal of Laryngology and Otology, London

**58**:465-502 (Dec.) 1943

Acute Otitic Barotrauma—Clinical Findings, Mechanism and Relationship to Pathologic Changes Produced Experimentally in Middle Ears of Cats by Variations of Pressure. E. D. D. Dickson, J. E. G. McGibbon and A. C. P. Campbell.—p. 465.
*Radon Treatment for Otitis Due to Barotrauma (Preliminary Report). E. P. Fowler Jr.—p. 489.

**Radon Treatment for Otitis Due to Barotrauma.**—Fowler says that at a U. S. Army general hospital in England attempts have been made to treat and prevent otitis due to barotrauma with radon. It was apparent that the men most susceptible to recurrent otitis media were those with large bands of lymphoid hyperplasia in their lateral pharyngeal walls. When these were present in aviators it seemed to predispose particularly to so-called aero-otitis, with high altitude flying or with dive bombing. Earlier, in his practice in New York the author had used two 25 mg. capsules of radium to shrink down excessive lymphoid tissue about the eustachian tubes of children, using the same dosage recommended by Crowe and his associates, who used radon for the same purpose. Radon was obtained in England and 150 millicuries was placed in two capsules and inserted along the floor of the nose and left in place for twenty-six minutes the first day. This gave a dosage of 66 milligram hours to the entire nasopharynx, a dosage equivalent to the 2 Gm. minutes recommended by Crowe. If the patient had a cold 33 milligram hours was given, and if there was no reaction in two or three days the remaining 33 milligram hours was applied. In the past year 127 men of the air force and the ground force have been given treatment of 66 mg. hours, repeated every three to six weeks up to four or more treatments. There is rarely improvement before the third treatment if 66 mg. hours has been used. The dramatic effect on fliers was not surprising, for it is well known that lymphoid tissue is highly susceptible to radiation and most of the fliers had only a small amount to shrink away. This small amount apparently is enough to clog their eustachian tubes if they fly high or change altitude rapidly. Once they are unable to clear their tubes while descending, edema develops in the middle ear with more or less fluid and they may be grounded from two days to several weeks with aero-otitis. The radon apparently facilitates the normal function of the tube if lymphoid hyperplasia has interfered with their proper opening and closing. It puts previously grounded airmen back in the air, even when they have had repeated severe otitis from barotrauma.

### Medicina, Madrid

**12**:227-290 (April) 1944. **Partial Index**

*Primary Cancer of Liver. M. Valdés Ruiz, A. Zamanillo and E. Salar Luis.—p. 227.

**Primary Cancer of Liver.**—According to Valdés Ruiz and his collaborators the frequency of primary cancer of the liver without cirrhosis, as reported in the literature, is 1 in 1,000. The symptoms are those of constant epigastric pain which radiates to the right shoulder, loss of appetite, nausea, vomiting, insomnia, headache and acute progressive emaciation. There are progressive uniform enlargement and hardening of the liver, ascites and in rare cases enlargement of the spleen. Primary cancer of the liver without cirrhosis can be differentiated from either primary cancer of a cirrhotic liver or secondary hepatic cancer by the rapid enlargement of the liver, its firmness, a smooth hard border on palpation, moderate ascites and the acute course of the disease, which varies between four and five months after the onset of the symptoms. Cancer hepatoma as found at necropsy is either massive or nodular. The histologic preparations of the liver in cases of nodular cancer show infiltration of the liver parenchyma by cords of cancer cells. Morphologic changes of the liver cells, mytosis and a large number of atypical cells and large cancer cells are observed.

# Book Notices

**Hydronephrosis and Pyelitis (Pyelonephritis) of Pregnancy: Etiology and Pathogenesis. An Historical Review.** By H. E. Robertson, M.D., Section on Pathologic Anatomy, Mayo Clinic, Rochester, Minnesota. Cloth. Price, $4.50. Pp. 332, with 11 illustrations. Philadelphia & London: W. B. Saunders Company, 1944.

This historical review of hydronephrosis and pyelonephritis of pregnancy is a rare book. The author, a pathologist at the Mayo Clinic, became interested in the subject when many years ago he began to observe at postmortem examinations of pregnant women that the ureters and renal pelves were dilated. As a result of this interest he read and thoroughly analyzed practically every article and book written on the disturbances of the urinary tract in pregnancy. Throughout the text and the numerous pithy footnotes, there is abundant evidence that the author took nothing for granted. He delved into all the original source material published and gives the impression of having read almost every word of the 974 references which are listed in the back of the book. The author points out errors made even by recognized authorities. He shows how often erroneous statements have been reproduced by writer after writer who did not take the trouble to check the original quotations or references.

The only unfavorable criticism offered is that the author should have devoted more space to the subject of treatment. In reality there is only one paragraph, a third of a page long, at the end of the conclusions of the book. Perhaps it is because the author is a pathologist that he refrained from doing this, but he accomplished his task of discussing dilatation and infection of the ureters in pregnancy so admirably that he would have handled the treatment just as satisfactorily.

In the brief but excellent conclusions the author summarizes all the important knowledge we possess about the etiology, anatomy, pathology and bacteriology of hydronephrosis and pyelonephritis of pregnancy.

This is one of the most discerning books, and if any physician, be he obstetrician, urologist, pathologist or general practitioner, wants a real treat, he should read it all the way through. The author is to be highly complimented on his achievement, which represents an enormous amount of hard work. The publishers also have done their part beautifully.

**The Dental Treatment of Maxillo-Facial Injuries with Supplementary Material on Cases and Techniques.** By W. Kelsey Fry, M.C., M.R.C.S., L.R.C.P., Consulting Dental Surgeon to the Royal Air Force, P. Rae Shepherd, L.D.S., R.C.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit, Alan C. McLeod, D.D.S., B.Sc., L.D.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit, and Gilbert J. Parfitt, M.R.C.S., L.R.C.P., L.D.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit. With foreword by Professor F. R. Fraser, M.D., F.R.C.P., Director General, Emergency Medical Service, and a section on Fractures of the Middle Third of the Face by A. H. McIndoe, M.S., F.R.C.S., F.A.C.S., Consulting Plastic Surgeon to the Royal Air Force, Surgeon-in-Charge, East Grinstead Maxillo-Facial Unit. Fabrikoid. Price, $6.50. Pp. 434, with illustrations. Philadelphia & Montreal: J. B. Lippincott Company, 1944.

During this war the English have had extensive opportunities for the study and treatment of maxillofacial injuries. The employment of common sense with basic principles is noted throughout the book, together with the fact that a wounded patient is being treated rather than an injury with a patient attached to it. Although the chapter on anatomy is much too brief, the excellent description of the muscle pull and its relation to the type of fracture compensates in some degree. The chapter on radiology fills in some measure the need for roentgenology of the facial bones. It is most practical and replete with plates and diagrams. The section on pathology is a welcome addition in a treatise on maxillofacial injuries. Both students and specialists could well profit by reading and rereading it. The authors belong to the school that advocates removal of teeth in line of fracture. An opposite school holds that such teeth should be removed only when there is an indication of trouble, that the tooth should be retained for better approximation of the bone fragments.

Much emphasis is placed on the cast cap splint for fractures of the mandible. This method seems to find greater favor among our English colleagues, whereas the Gilmer method of wiring (or one of its modifications) is more extensively used in the United States.

The chapter on technic of impression taking and construction of splints is very detailed and most explicit.

The section on field and preliminary hospital treatment of battle casualties can be read with advantage by all medical men engaged in front line action. It is practical and contains much good common sense.

Physiology is stressed throughout the book in connection with treatment.

The supplement with case studies is explicit and instructive, not only for war injuries, but also for maxillofacial injuries occurring among the civilian population during peacetime. The book is profusely illustrated with excellent diagrams and photographs. The reproductions of the roentgenograms are, however, not as clear as they might be.

**Artificial Pneumothorax in Pulmonary Tuberculosis Including Its Relationship to the Broader Aspects of Collapse Therapy.** By T. N. Rafferty, M.D. Introduction by Henry Stuart Willis, M.A., M.D., Superintendent and Medical Director William H. Maybury Sanatorium, Northville, Michigan. Cloth. Price, $4. Pp. 192, with 26 illustrations. New York: Grune & Stratton, 1944.

This book provides a discussion of collapse therapy of pulmonary tuberculosis, with special reference to artificial pneumothorax. The author believes that the old practice of attempting artificial pneumothorax in every case before considering surgery, particularly thoracoplasty, should be abandoned and that persons whose disease is so extensive as to require permanent collapse, those with serious pleural infections and those with bronchial tuberculosis should have extrapleural thoracoplasty performed as the primary procedure.

The author believes there is general agreement on the indications for artificial pneumothorax under the following conditions: (1) patients with disease which continues to progress in spite of the usual care; (2) those with cavities and tubercle bacilli in the sputum which do not come under control promptly by bed rest; (3) extensive disease with cavity which could not be expected to be brought under control by the so-called more conservative methods; (4) those with predominantly exudative disease that does not regress after a liberal period of bed rest or bed rest and phrenic paralysis.

Contraindications to artificial pneumothorax which the author considers permanent are (1) a large apical cavity, (2) extensive destruction, (3) the fibrous or shrunken lung and (4) bronchostenosis. Contraindications which may be temporary or permanent are (1) active bronchial tuberculosis without pronounced stenosis, (2) tuberculous pneumonia and (3) primary tuberculosis. Tuberculous complications, such as laryngitis and enteritis, do not contraindicate artificial pneumothorax except when they are terminal manifestations. Compensated heart disease is not a contraindication unless the tuberculosis is extensive and bilateral. The author wisely points out that in cases of complication the decision concerning pneumothorax can be made only at the bedside.

A liberal point of view is taken on the future possibilities of ambulatory artificial pneumothorax. For example, when all the citizens of the nation are examined and those are found who have recently developed minimal or moderately advanced tuberculosis, so many would need treatment that it would be economically unsound to provide sufficient bed capacity for them. Moreover, if this capacity should be provided it would not long be needed if the intensive program of finding cases was continued. Ambulatory pneumothorax would aid substantially in solving this problem.

In this connection one wonders why the author completely omitted the tuberculin test and emphasized the use of mass radiography in case finding. The tuberculin test is a far better criterion of the tuberculosis situation in any community than the x-ray film. Probably this omission is because he assumes that any physician would have definitely established a diagnosis of tuberculosis before instituting collapse therapy in any form. Unfortunately, many persons are having artificial pneumothorax instituted with diagnoses made on the basis of x-ray shadows and in the total absence of our only two specific findings in

tuberculosis, namely the tuberculin reaction and the recovery of tubercle bacilli.

The pros and cons of instituting artificial pneumothorax in all cases of minimal tuberculosis are discussed. Various other surgical procedures are discussed, such as external drainage of pulmonary cavities, lobectomy and pneumonectomy.

The book contains 195 references and a good index. The author is to be congratulated on having brought together so much valuable information and treating it so adequately and fairly in such small space. This book should be read by all physicians and studied carefully by those who treat chest diseases.

**Young Offenders: An Enquiry into Juvenile Delinquency.** By A. M. Carr-Saunders, Hermann Mannheim and E. C. Rhodes. Cloth. Price, $1.75. Pp. 168. New York: Macmillan Company; Cambridge: University Press, 1944.

This short book reports a survey beginning in 1938, and extending for a year, intended to disclose causes of crime in England as elicited by statistical means. There is a survey of previous studies, and the present analysis is made not only in London but in outlying communities, and a control group is added which is an unusual feature in statistical studies of delinquency. While there are many objections to the way the control group was selected, for each delinquent was matched with a boy of the same age who was not a delinquent from the same community, nevertheless the present study is unique and notes more strongly the influence of social factors emphasizing the beliefs that experts on delinquency have had for some years; for example, the importance of broken homes, the meaning of the presence of other delinquents in the family and the significance of leisure-time interests. There is no attempt to make a psychologic breakdown of the cases included, analyzing such factors as motives, mechanisms and diverse therapeutic procedures which in the United States are superseding this statistical approach to a great extent. Nevertheless the work has been soundly done and, while it has no bearing on delinquency in wartime, nevertheless it will probably form one of the statistical bricks in the edifice of delinquency prevention.

**Fertility in Men: A Clinical Study of the Causes, Diagnosis, and Treatment of Impaired Fertility in Men.** By Robert Sherman Hotchkiss, B.S., M.D., Lieutenant Commander (MC), U.S.N.R. With a foreword by Nicholson J. Eastman, M.D., Chairman, Editorial Committee, National Committee on Maternal Health. Fabrikoid. Price, $3.50. Pp. 216, with 95 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

**Fertility in Women: Causes, Diagnosis and Treatment of Impaired Fertility.** By Samuel L. Siegler, M.D., F.A.C.S., Attending Obstetrician and Gynecologist, Brooklyn Women's Hospital. With a foreword by Robert Latou Dickinson, M.D. Fabrikoid. Price, $4.50. Pp. 450, with 194 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

These companion volumes have been produced under the stimulus of a series of fortunate circumstances centering in the study of the fertility mechanism by a group of medical scientists and clinicians in New York City. The National Committee on Maternal Health and some of its officers share considerable responsibility with the two authors. The latter are men who have devoted much time to investigations in the fields about which they write, and consequently their evaluation of the work of other men is critical and also comprehensive. The books are well written, easy to read, liberally illustrated and thoroughly documented. The history of the subject occupies little space because of the relatively recent intensive and scientific studies of these fields. From the clinician's point of view these volumes will be helpful because they combine understanding of anatomy, physiology, pathology, bacteriology, endocrinology and clinical skill with therapy. They are not textbooks for beginners but will be unusually valuable handbooks for any clinician who expects to give thoughtful attention to the problems of fertility in either sex. Both authors stress the point that fertility must be considered as a bisexual problem and to a certain extent both partners of every marriage investigated before detailed studies of either one are attempted. Clinical and laboratory technics described are presented with adequate details, so that any well trained clinician can use them without further laboratory guides or details.

**The Principles and Practice of Ophthalmic Surgery.** By Edmund B. Spaeth, M.D., Professor of Ophthalmology in the Graduate School of Medicine of the University of Pennsylvania, Philadelphia. Third edition. Cloth. Price, $11. Pp. 934, with 562 illustrations. Philadelphia: Lea & Febiger, 1944.

The second edition of this excellent treatise on ophthalmic surgery was reviewed in these columns three years ago come November. The third edition, appearing after such a short time, reveals not so much the advances in surgery of the eye as it does the popular demand for a book of this caliber. It contains only 48 more pages than does its predecessor, but it has 105 valuable new illustrations. The most pronounced textual changes deal with the physiology of squint and with the development of nonsurgical principles associated with its correction. This is sound common sense writing, and the material is presented in a most understandable manner. The subject of ptosis has been revamped and reclassified, thus simplifying the principles of its surgical correction. The newest material in this edition is that dealing with gonioscopy, both preoperative and postoperative, with copious quotations from Kronfeld and Barkan. The chapter on the surgical treatment of detachment of the retina should be rewritten, eliminating some of the older operations that have been abandoned, such as the Guist, and elaborating somewhat more on the present day methods. A good working bibliography adds much to the usability of the book, which should be found on the work table of every operating ophthalmologist.

**Hackh's Chemical Dictionary [American and British Usage] Containing the Words Generally Used in Chemistry, and Many of the Terms Used in the Related Sciences of Physics, Astrophysics, Mineralogy, Pharmacy, Agriculture, Biology, Medicine, Engineering, etc. Based on Recent Chemical Literature with Numerous Tables, Diagrams, Portraits and Other Illustrations.** Third edition, by Julius Grant, M.Sc., Ph.D., F.R.I.C. Fabrikoid. Price, $12. Pp. 925, with illustrations. Philadelphia: Blakiston Company, 1944.

This chemical dictionary needs no introduction to chemists and those interested in allied subjects. Now in its third edition, the book should continue to serve as a good reference source for explanation of words frequently used in chemistry and other terms often found in physics, astrophysics, mineralogy, pharmacy, agriculture, biology, medicine, engineering and other sciences. More than fifty-seven thousand terms are defined. Theories, laws and rules, elements, compounds, drugs, minerals, apparatus, instruments and names of investigators are only part of the subject matter. In these days it is almost imperative for progressive physicians to be familiar with chemical terms; the present book will provide much help on this score when placed in the medical library. Unfortunately, some of the medical definitions, including those for digitalis, penicillin, calgon, pineal gland and phenobarbital, are not so clear or accurate as they might be, although this failing could be corrected in the next edition with the aid of a physician scientist.

**Introduction to Physiological and Pathological Chemistry with Laboratory Experiments.** By L. Earle Arnow, Ph.G., B.S., M.D., Director of Biochemical Research, Medical-Research Division, Sharp & Dohme, Inc., Glenolden, Pennsylvania. With an introduction by Katharine J. Densford, B.A., M.A., R.N., Director of the School of Nursing and Professor of Nursing, University of Minnesota, Minneapolis. Second edition. Cloth. Price, $3.75. Pp. 574, with 144 illustrations. St. Louis: C. V. Mosby Company, 1943.

The second edition of this practical and well written book for nurses on physiologic and pathologic chemistry has been carefully revised. Newer data on sulfonamides, vitamins, the rennin mechanism of hypertension, hormones, muscle carbohydrate metabolism and other advances have been included. The first edition of the book was a contribution to nursing education in this field, and this edition ably perpetuates that distinction. Those who are not familiar with this textbook will find it one of the most effectively written volumes of its type. It is simply and authoritatively written and meets the current suggestions for teaching in this field by those interested in nursing education. Not only is the prevailing thought on biochemistry and physiology concisely presented, but the author's style is engaging. Those interested in nursing education will find this work authoritative and readable. It is highly recommended for nurses in training and for those who wish to keep abreast of current advances in physiology and chemistry.

# Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

## CLIMATE IN ASTHMA

*To the Editor:*—**The family of a 5 year old boy who is afflicted with an intractable case of chronic bronchitis and bronchial asthma has consulted me with a view to settling in one of the following localities for purposes of effecting a possible cure: El Paso, Texas; Reno, Nev.; Tucson, Ariz., and southern California. The youngster is allergic to house dust, dog and horse emanations, grass, plantain, ragweed, certain chemical compounds, as varnish, paint and lacquers, gasoline, kerosene, mustard, flaxseed, furnaces and gas stoves, and damp and musty places. Judging from available graphs relative to comparative climate, humidity and general atmospheric conditions, which of the cities mentioned (kindly cite a suitable southern California community of average size population) would prove most beneficial? Which other localities not mentioned might be suggested for maximum end results? Also would the gaseous and chemical fumes generated by the mining smelters in El Paso prove detrimental?**

**M.D., Connecticut.**

ANSWER.—In attempting to evolve a solution for the case in question it is important that one consider by what mechanisms an asthmatic person may expect to benefit as a result of a change in geographic location. The following are some of the explanations for the relief of asthma by a change of climate: 1. The removal of the patient from his allergenic environment may mean simply that a dog or cat or occupational source of allergy has been left behind. Or it may mean that the new general environment does not contain the same pollens, fungi or other atmospheric contaminants which were the cause of the patient's allergy. 2. In bacterial asthma, in asthma due to bronchitis or in cases in which the allergic asthma has become complicated by bronchitis, benefit may be obtained because of the favorable effect of some climates and regions on infectious respiratory processes. 3. Temperature changes, humidity and other physical atmospheric factors are known to affect asthma, both of allergic and intrinsic origin. As a simple illustration one may cite the ragweed sensitive patients who are most prone to precipitate their attacks of asthma after a sudden temperature change, fall in barometer or electrical storm. In certain regions such atmospheric contortions are at a minimum, so that some asthmatic patients are freed from one of the most potent causes precipitating their attacks. 4. An unclean air, due to soot, fumes and other chemical or mechanical irritants, may be an important factor. Some suburbanites may leave their home in apparent comfort and experience an attack of asthma when arriving in the city, particularly if atmospheric conditions have resulted in a low hanging, soot containing fog. Such patients may be benefited in rural districts, whether a few or several thousand miles away. 5. Psychogenic factors may also be at play in a climatic change. Benefit may be derived because of relaxation, being away from business or home environments and tensions, and because of the general psychic effect of a more pleasant climate. 6. Unexplainable influences may result in benefit to asthmatic patients not falling in the categories mentioned.

In applying these considerations to the case of the 5 year old boy it is quite evident that the information furnished is not entirely sufficient to justify an absolute opinion. It seems probable that three factors are at play in this case: allergy, bronchitis and influences of chemical irritants. If the pollen allergy is of major importance, southern California (Los Angeles, Pasadena, San Diego) should be satisfactory. If bronchitis is actually a prominent feature, Tucson would probably be the most desirable. If gasoline and similar chemical factors are largely to blame, the smaller communities in southern California or, perhaps, Tucson would be best. However, in such instances a home in a rural district in the patient's home state may also suffice. If weather changes seem to play a great part in the attacks, Tucson would be the best possibility. Attention should be called to the fact that, whether one can or cannot classify the patient in any of the groups mentioned, the individual's behavior is not entirely predictable. For a final opinion of the suitability of a chosen location or of even the desirability of any change, actual trial is the only answer.

No immediate information is available regarding the gases and fumes generated by the mining smelters in El Paso; if present in noticeable concentration, they would certainly be detrimental.

The reference of the inquirer to a "cure" is deserving of comment. Generally speaking, asthma due to allergy is not cured by climatic change; it is only temporarily checked. The allergic irritation returns on the patient's return to his environment. Cure can be expected only in those cases in which the bronchial infection or inflammation has become the most important reason for the continuation of the asthma. In such instances the healing of the inflammatory process may condition the respiratory tract to be less susceptible to infection and perhaps also to allergy.

## PLANTAR WARTS

*To the Editor:*—**May I request information on the most effective treatment for the removal of plantar warts?**

**Captain, M. C., A. U. S.**

ANSWER.—Plantar verruca is one of the most difficult dermatologic problems. Probably because of the thickness of the epidermis of the sole and the constant pressure on verrucae in this region, they are much harder to cure than in any other location. They are of the same nature and yield when curable to the same measures but less readily.

After the usual popular remedies, including suggestions have been tried and failed, the preferred treatment, painless, prompt and not apt to cause scars, is irradiation. MacKee (X-Rays and Radium in the Treatment of Disease of the Skin, ed. 3., Philadelphia, Lea & Febiger, 1938, p. 638) recommends small doses compared to those used by others, 300 roentgens for most cases, sometimes 450 to 600 roentgens. He warns against more than two doses, preferring to use electrodesiccation for further treatment. He insists on protection with lead foil to the very edge of the lesion and warns against use of the rays in inflamed warts or those that have had caustics used on them. In these cases wait for the irritative effect to subside before irradiating them. Allow at least a month after the last irradiation before using any irritating treatment.

Radium may be used, a half strength placque with 1 mm. of aluminum, fifteen to thirty minutes or even longer. In thick hyperkeratotic lesions gamma radiation may be employed, using the half strength placque with 1 mm. of brass and 1 mm. of aluminum for one to two hours or longer.

The use of electrosurgical modalities is perhaps the most popular of all methods of treating plantar warts and is effective in a good percentage of cases. It is difficult to use in young patients, however. One may use light applications repeated every week or two for a series of treatments.

## CONTAMINATION OF FOOD WITH CIGARET ASH

*To the Editor:*—**How harmful is cigaret tobacco ash, for example, when it is accidentally spilled on food and the food accidentally eaten?**

**M.D., Massachusetts.**

ANSWER.—The ash of cigaret tobacco itself may contain traces of lead or arsenic, as well as carbon and mineral constituents, but in itself it is not harmful when ingested in small amounts. However, the incompletely burned cigaret tobacco behind the burning point may contain rather high concentrations of tobacco alkaloids, and so care should be taken to avoid contamination of food with material from the stump, behind the ash. Nicotine poisoning, with fatalities, has been reported from contamination of food with cigaret residues, but it is the unburned material, not the ash, which is here responsible.

Reference:

Bogen, Emil: The Composition of Cigarets and Cigaret Smoke, THE JOURNAL, Oct. 12, 1929, p. 1110.

## LACERATED RECTUM FROM JOHNSON GRASS

*To the Editor:*—**I want to report a case which, to me, is most unusual. A patient came in on July 10, 1944 complaining of severe lower abdominal pain. There was a rigidity of both sides of the lower abdomen. The abdomen was tender in this region, and there was a rebound tenderness also all over the whole lower part of the abdomen. He gave a history of having gone to a public toilet and, finding it occupied, he went into a nearby orchard. He sat down quickly, and a stiff stem of Johnson grass entered the anus without producing visible injury to the anal opening. Because of the findings described and a white blood cell count of 22,000 within two hours after the injury, I opened the abdomen by means of a midline incision. On the anterior aspect of the rectum a lacerated longitudinal tear was found in the rectum about 1½ inches long. The lower part of the wound was just above the cul-de-sac. I closed the laceration with interrupted sutures of chromic catgut. The whole area was liberally sprinkled with 5 Gm. of sulfathiazole crystals. The abdomen was carefully wiped and the abdomen closed without drainage. The patient was put on a nonresidue diet and six days after operation was given a saline laxative. The wound healed by first intention except for the lower third, from which there was a small amount of subcutaneous drainage. He has made an uneventful recovery.**

**Ewald A. Larson, M.D., Kingsburg, Calif.**